

Sale of Low-Priced Refrigerators by Public Utilities In Tennessee Valley Disturbs Dealers

(Concluded from Page 1, Column 4)

R. Chambliss, Rentz, Ga.; Middlebrooks Furniture Co., Barnesville, Ga.; Jack Ramsey Sales Co., Springfield, Ga.; Fort Valley Motor Co., Fort Valley, Ga.; Sigman Radio & Elec. Co., Sparta, Ga.; Harris & Lumpkin, Taylorsville, Ga.; R. E. Lambert & Sons, Darlington, Ala.; Sterchi Bros. Stores, Inc., Rome, Ga.; Word Furniture Co., Scottsboro, Ala.; Bernstein Furniture Co., Inc., Athens, Ga.; R. B. Evans Motor Co., Inc., Douglas, Ga.; Doster Drug Co., Lyerly, Ga.; Reeves Hardware Co., Clarksville, Ga.; J. R. Mayson, Lavonia, Ga.; Stone Florance Drug Co., Wrens, Ga.; Holley Hardware Co., Graniteville, S. C.; M. T. Sanders, Commerce, Ga.; Quitman Electric Co., Quitman, Ga.; Cain's Pharmacy, Hampton, Ga.; Electric Equipment Co., Newnan, Ga.; R. Moss Furn. Co., Calhoun, Ga.; Cummings & Long, Rockmart, Ga.; Morrow-Cook Furniture Co., Albany, Ga.; Yates Music House, Roanoke, Ala.; Wynne's, Griffin, Ga.; Loti Bros., Americus, Ga.; Tri-Co Furniture Co., Barnesville, Ga.; Fairfield Radio & Refg. Co., Fairfield, Ala.; Torrey Hdw. Co., Elberton, Ga.; LaGrange Hdw. Co., LaGrange, Ga.; Lovett & Tharpe Hdw. Co., Dublin, Ga.; Grindle Drug Co., Lumber City, Ga.; Cummings & Lory, Cartersville, Ga.; Falkner & Co., Vernon, Ala.; A. W. Hengstler, West Point, Ga.; Blue Ridge Pharmacy, Blue Ridge, Ga.; McCurdy's Drug Store, Clayton, Ga.; Evans Pharmacy, Warrenton, Ga.; Mather & Youmans Co., Valdosta, Ga.; Ballenger Hdw. Co., Seneca, S. C.; Cook Hardware Co., Wrightsville, Ga.; J. W. Haley, Ashburn, Ga.; Purchase & Sale Co., Inc., Milledgeville, Ga.; Myers-Dickson Furniture Co., Atlanta, Ga.; Monticello Hardware Co., Monticello, Ga.; Evahers Furniture Co., Macon, Ga.; McPherson Radio Shop, Oneouke, Ala.; Hunter Furniture Co., Madison, Ga.; Baker Furniture Co., Estill, S. C.; The Matthews Hardware Co., Inc., Camden, Ala.; Sterchi Bros. Stores, Inc., Dalton, Ga.; I. Y. Suggs, Bremen, Ga.; McBrayer Bros. Furniture Co., Rome, Ga.; Z. S. Bardwell Co., Talbotton, Ga.; Lucas-Kidd Norge Co., Anderson, S. C.; J. C. Van Houten Co., LaGrange, Ga.; Still Furniture Co., Moultrie, Ga.

TVA Appliance Situation Interests Furniture Dealers

Periodical Publishing Co.
Grand Rapids, Mich.
July 13, 1934.

Publisher:

The editorial in your issue of July 11 "The TVA Situation" is a peach. May we have your permission to reprint this editorial in full with proper credit, of course, and with some editorial comment? We plan to use it if you permit in the August issue of *Furniture Record and Journal*, inasmuch as the electrical appliance situation in the TVA district is of great interest to a consider-

able number of home furnishing dealers, not only in that territory, but in other parts of the country.

J. N. NIND, JR.,
President.

An Invitation from Munger to Inspect EH&FA Operations

Electric Home & Farm Authority, Inc.
An Agency of the Tennessee Valley Authority
Chattanooga, Tenn.
July 14, 1934.

Publisher:

I have just read an editorial in *ELECTRIC REFRIGERATION NEWS* of July 11, entitled "The TVA Situation." While I am of the opinion that a few of the points discussed in this article could have been worded somewhat differently to more correctly describe the situations as they actually exist, I wish to express my interest to you in the article generally, and to thank you for the constructive suggestions which it contains. However, I believe the writer of this article did not have available all of the information that might be considered pertinent to the program.

We realize that the ramifications of so huge a plan offer opportunities for constant improvement, and it is not disappointing that we can now see, after a few weeks of operation, where certain alternatives can be advantageously incorporated. Plans in this direction are definitely under consideration at this time.

I know that you are desirous of presenting to the readers of *ELECTRIC REFRIGERATION NEWS* accurate information—and all of the accurate information of interest to the industry. With this in mind, and the desire to obtain the benefit of your own advice, I extend to you a personal invitation to visit me in Chattanooga, at an early date. I have suggested Chattanooga, rather than Detroit, inasmuch as EH & FA activity is located here and I am confident you would be interested in looking over the operations that we are conducting.

G. D. MUNGER,
Commercial manager.

Frigidaire Distributor In Memphis, Tenn., Enjoys July 11 Issue

McGregor's, Inc.
680 Union St., Memphis, Tenn.
July 13, 1934.

Editor:

For your information, this company is the distributor of Frigidaire products in Memphis, and a very large territory adjacent thereto, and we ask that you be good enough to send us 10 extra copies of the July 11 issue of the *ELECTRIC REFRIGERATION NEWS*, billing us for same, and we will promptly remit.

I certainly did enjoy reading the current issue. For your information, we are in the TVA section.

JOHN M. MCGREGOR.

Potter Says Specialty Dealer Being Led Into Bankruptcy

Potter Refrigerator Corp.
220 Delaware Ave., Buffalo
July 13, 1934.

Editor:

I have just finished reading your able editorial in the July 11 issue of *ELECTRIC REFRIGERATION NEWS* on "The TVA Situation."

This editorial adds emphasis to what a few of us in the industry have been advocating for the past several years. The great scramble for volume at any cost between four or five of the large producers in this industry has set a pace which, for the industry as a whole and for dealers in particular, has been financially disastrous. The TVA model is indeed a climax to the kind of thinking and the sense of values which has cost this industry its opportunity for real profits, and which is rapidly leading the specialty dealer (without whom there never would have been a refrigeration industry) into a condition bordering upon bankruptcy.

It is true that the tremendous activities of the refrigeration industry as a whole are building profits for the power companies. It is also true that many department stores have found it profitable this last year to take orders for refrigerators which were actually sold by the earnest efforts of specialty houses and their salesmen. It is also true that last year, with over 1,000,000 units sold, the industry as a whole was in the red, and that this year, only a small profit has been made by the industry in proportion to the volume of sales, capital investment, and effort expended.

Three years ago, as spokesman for

the minority, I prophesied this condition, yet those who then dominated the industry turned a deaf ear to such prophecies. It almost seemed as if mine was indeed, "a voice crying in the wilderness."

Now, on behalf of those manufacturers who insist on staying sound and whose path is made doubly difficult by tactics which savor of the methods of Roosevelt's famous "un-fair 10 per cent," I take this opportunity again to challenge the sound thinking ability of the men in this industry; but this time, I challenge them not with prophecies, but with the plain statement of facts.

To make these facts clear, I ask to be excused for becoming personal. My own company has consistently pursued the policies which I have advocated for the industry as a whole during the past several years. The net result is this: The actual sales, from coast to coast, made by our dealers this year, of all models and sizes, has shown an average gross profit (after deducting freight, installation, and service) of \$100.36. And I challenge any man in the industry to weigh the soundness of the principles which make such a profit possible against the principles which ask a dealer to content himself with the profit per sale which you speak of in your TVA editorial.

Some of us still hold the old-fashioned belief that fundamentally, we are in business to make a profit. Without a sound profit, business cannot survive. Neither should a factory survive if its rise to the heights of volume is attained at the cost of its dealers. The TVA model surely becomes a symbol of the kind of business thinking and business values which have prolonged this depression unduly, and which have made it possible for the political forces in this country to attempt to control business as a protection to the American people.

Yet, in spite of the prevailing unsound business leadership and in spite of the peculiarly growing political control of business, we still hold to the principle that even under these conditions, individual initiative, unless throttled, can be profitable; and I state, this is not a theory—it is a demonstrated fact, proven under the conditions prevailing this year by a coterie of men from coast to coast—proven with profits of \$100 per sale.

What these men are now doing, others can do. Refrigeration is a vast field, and it represents a tremendous profit opportunity and a real future for any sound manufacturer who has vision enough to look first to the success and profits of his dealers, and who will not be blindly swayed by the great desire to play the power companies' game.

T. IRVING POTTER,
President.

N. J. Public Service Sales Set Record

NEWARK—New records for the sale of both electric and gas refrigerators are being made this year in the territory covered by operating companies of the Public Service Corp. of New Jersey, utility officials report.

Installations of Electrolux gas refrigerators in May totaled 469 units, the largest in any month in the history of Public Service Corp.

Kelvinator sales that month were the largest for any May on record, exceeding sales in the best preceding May by 6.3 per cent.

Kelvinator unit sales for the first five months of this year in the Public Service Corp.'s territory are ahead of the corresponding period last year by 16.1 per cent in the household field and 4.5 per cent in the commercial division.

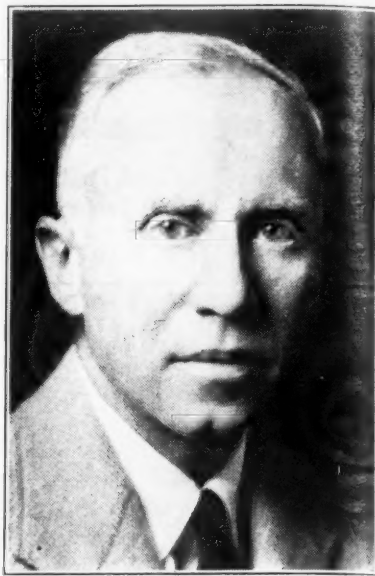
Furniture Store Buys 4 Carloads of Gibsons

ALBANY, N. Y.—Capital City Distributing Corp., Gibson distributor here, has just completed sale of four carloads of Gibson household refrigerators to the Breslaw Brothers Furniture Stores. One carload will go to each of the four stores, which are located in Albany, Schenectady, Glens Falls, and Saratoga. The furniture company is laying plans for a special midsummer campaign on refrigeration, according to Max E. Hegleman, sales manager of the distributorship.

Starr Catalog Illustrates Models in Kitchens

RICHMOND, Ind.—Feature of the new domestic electric refrigerator catalog recently published by The Starr Co., manufacturer of Starr Freeze electric refrigerators, are illustrations showing each model in typical kitchen settings.

Heads Agency



A. W. SEILER

Seiler Named President Of Cramer-Krasselt

MILWAUKEE — A. W. Seiler has been elected president of the Cramer-Krasselt Co., advertising agency here which handles advertising for Norge appliances and Waukesha refrigerators. He took over his new duties June 8. He has been associated with the agency since 1907.

Kelvinator Dealer's Truck Has Expanding Sides

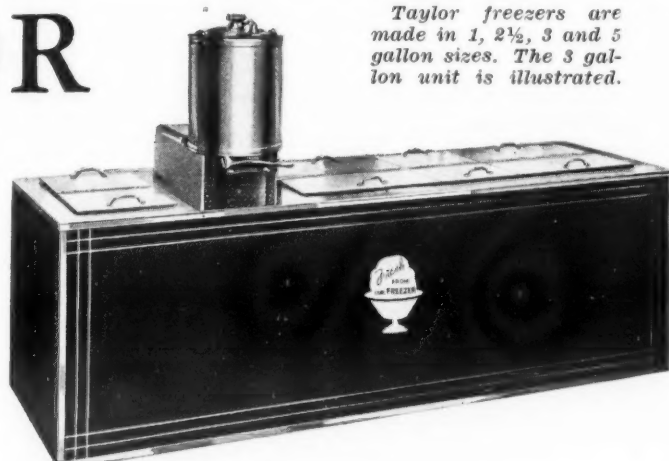
DETROIT—Powers Furniture Co., Kelvinator distributor in Portland, Ore., is expanding its dealer set-up this year by means of an "expanding" display truck.

This special truck expands 2 ft. on either side to provide a 5-ft. aisle between a double row of Kelvinators arranged in the truck's interior.

When the truck is on the road the sides are drawn together and the top lowered 18 in., giving the vehicle a more compact appearance and putting its load in the center.

Interior equipment of the truck includes a movie screen, a radio, and several folding chairs, so that dealers may be given the complete Kelvinator story right on the spot.

TAYLOR Revolutionized the ICE CREAM INDUSTRY!



Taylor freezers are made in 1, 2½, 3 and 5 gallon sizes. The 3 gallon unit is illustrated.

From coast to coast, drug stores, restaurants, hotels, etc., are making THEIR OWN ICE CREAM with the Taylor Freezer. This freezer brought about radical changes in merchandising and manufacturing ice cream and opened a new field for steady, substantial profits for refrigeration dealers.

Taylor is the pioneer and peer of counter freezers. It is beautifully designed and constructed for years of constant trouble-free operation. It is easily and quickly installed.

Dealers are invited to request full information.



TAYLOR FREEZER CORP.

"WORLD'S FINEST ICE CREAM EQUIPMENT"

BELOIT, WISCONSIN

UNLIMITED PROSPECTS

Count the number of these establishments in your territory and you can determine the number of potential buyers of Taylor freezers:

Cafeterias	Grocery Stores
Colleges	Hotels
Confectionery Stores	Ice Cream Parlors
Creameries	Institutions—State & Federal
Delicatessens	Post Exchanges—Army & Navy
Department Stores	Schools
Drug Stores	Tea Rooms
Hospitals and Sanitariums	Y. M. C. A.'s



FREON UNITS FOR AIR CONDITIONING

They give that low-cost, trouble-free service that builds lasting good will. Investigate the added advantages of using Reliance Condensing Units for all types of refrigerating duty.

GALVANIZED STEEL FINNED COILS
Made of steel throughout. Positive METAL-TO-METAL contacts. Will not lose original efficiency because of oxidation between tubes and fins.

RELIANCE REFRIGERATING MACH'Y
CO. 3409 N. Kedzie Ave., Chicago
Export Div.: A. J. Aldorf Corp., 223 W. Jackson Bldg., Chicago, Ill., U. S. A. Cable: Aldorf-Chicago



1/3 TO 30 TONS DAILY CAPACITY

REFRIGERATION NEWS

Registered U. S. Patent Office

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matter Aug. 1, 1927THREE DOLLARS PER YEAR
TEN CENTS PER COPY

Kelvinator Corp. Reports Profits For 9 Months

**Net Profit Is \$1,212,421,
Nearly Double Report
For '33 Period.**

DETROIT—Following a directors' meeting held Thursday, July 19, Kelvinator Corp. reports net profit of \$1,248,839.00 after all charges and reserve for federal tax for the quarter ending June 30, 1934.

This compares with \$1,414,564.00 for the same quarter of the previous year. For the nine months of the fiscal year, net earnings are \$1,212,421.00, as compared with \$622,828.00 for the corresponding period ending June 30, 1933.

These figures do not include the earnings of Refrigeration Discount Corp., a wholly owned subsidiary, whose profits are customarily taken as a dividend at the close of the fiscal year ending Sept. 30.

Commenting on this statement, G. W. Mason, president, states that while June volume was disappointing, July is showing a marked improvement.

The directors voted a 12½ cent dividend payable October 1, 1934, to stock of record Sept. 5. This action changes the regular dividend dates from the fifteenth to the first of the month.

Markland to Assist Petrie at Kelvinator

DETROIT—Appointment of H. E. Markland as assistant domestic sales manager for Kelvinator Sales Corp. has been announced by R. I. Petrie, Kelvinator domestic sales manager.

Mr. Markland has been with Kelvinator for more than eight years, having served as district manager, regional manager, branch manager, and special sales representative.

From 1920 to 1922 he was sales manager for Colorado Toy Co. in New York City. He then joined Detroit Flag & Mfg. Co. as vice president and sales manager, occupying that post until 1925, when he became a Kelvinator district manager.

In 1926 he was appointed regional manager in charge of Kelvinator sales operations in Illinois, Iowa, Nebraska, Montana, North Dakota, South Dakota, Wisconsin, and Minnesota. Three years later he was elevated to the management of Kelvinator's Cleveland branch.

He left that position in 1931 to become Michigan manager for National Lock Co., but returned to Kelvinator in February, 1932, as Philadelphia branch manager. Since June of that year he has been engaged in special sales work for the parent organization.

Jack Clark of Norge Drowns off Muskegon

DETROIT—Jack Clark, assistant manager of Norge Corp.'s plant at Muskegon, Mich., and Ralph Balleaw, general manager of the Muskegon Construction Co., were drowned in Lake Michigan Sunday afternoon, July 22. Their bodies had not been found at 5 p. m. the following day, according to H. Morley of Norge headquarters here.

Mr. Clark and Mr. Balleaw, with Mrs. Balleaw and Mrs. Clark's 18-year-old sister, were sailing two or three miles from the coast guard station at Muskegon when the heavy boom on the boat's sail struck Mr. Balleaw and knocked him into the water. Mr. Clark dived in to help his friend.

By the time Mrs. Clark's sister could bring the boat about, neither of the men could be found. Mrs. Balleaw fainted, and the girl, who had never sailed a boat before, brought it to shore after giving up the search.

New Service Men's Society To Meet in Chicago

CHICAGO—First annual convention of the newly organized Refrigeration Service Engineers' Society has just been scheduled for Oct. 11, 12, and 13 in Chicago.

Carrier Orders for Air Conditioning Increase 98%

NEWARK, N. J.—Carrier Corp. reports that accepted contracts for air-conditioning installations in the first six months of this year amounted to \$3,463,000 compared to \$1,746,000 for the similar period of 1933, an increase of 98 per cent.

Carrier Corp. carried over into the second half of the year \$1,935,000 of uncompleted contracts, an increase of \$673,000, and the first time in four years that unfilled orders for the first six months have shown an increase.

Wurlitzer Appoints New Executives

CHICAGO—Several additions to the executive personnel of the Rudolph Wurlitzer Co. were announced by Fanny Wurlitzer, president, at a three-day sales conference of the company's officials here recently.

New vice president and general manager of the organization is R. C. Roling, formerly vice president and works manager of Grigsby-Grunow Co. He has also been made a director. Herman Fleer, formerly vice president of the White Enamel Refrigeration Co. in New York City, has been appointed general retail sales executive. Before joining the White company, he was vice president and general manager of Lyon & Healy, Chicago. John Weis, for a number of years Wurlitzer's general auditor, has been appointed comptroller and secretary of the company.

Appointment of Earl L. Hadley as advertising manager was announced several weeks ago in *ELECTRIC REFRIGERATION NEWS*.

Introduced at the meeting were a new line of radios, a simplex automatic phonograph, a new model grand piano, and a new upright-type piano.

Spencer Heads Norge Plant at Muskegon

MUSKEGON, Mich.—Harry Spencer, formerly service manager of Norge Corp., has been appointed manager of that company's plant here. J. R. Cameron now has charge of the Norge service operation, headquarters of which have been moved here from the Detroit factory.

Stewart-Warner Brings Out New Radios

CHICAGO, July 23—Distributors of Stewart-Warner radios began to file into Chicago to attend the convention at which Stewart-Warner Corp. will disclose its plans on radios for the coming year.

The convention will be held in three divisions. Meetings for the first division open today, the second division convenes Thursday, and the third division starts its meetings next Monday.

Still a Shelvador



Lewis Crosley (right), vice president and R. H. Money, chief refrigeration engineer, inspect the Crosley chest model, with Shelvador top.

Crosley's Chest Model Employs Shelvador Top

**Retail Price Is \$72.50
East of the Rockies;
Standard Unit Used**

CINCINNATI—Crosley Radio Corp. last week introduced a "chest" model electric refrigerator featured by the inclusion of the Shelvador principle in the "lift" top.

This new Crosley model will retail for \$72.50 east of the Rockies and \$75.00 west of the Rockies. It will be marketed through the regular Crosley distributor and dealer channels.

It has a food storage capacity of 2 cu. ft. net and has 4.2 sq. ft. of shelf space. The door is of the exclusive Crosley recessed Shelvador type, with three racks for eggs, fruit, and small packaged articles.

The standard Crosley compressor with a ½-hp. motor furnishes refrigeration for the "chest" model. Two ice cube trays have a minimum capacity of 2 lbs. of ice at a freezing.

Cabinet interior and top are finished in porcelain, exterior in white lacquer, with black trimmings. Hardware is stamped brass, nickel plated.

Exterior dimensions of the new Crosley model are height, 36 in.; width, 23½ in.; depth, 20½ in.

Newcomb & Vining Receive Promotions

MANSFIELD, Ohio—T. J. Newcomb has been transferred from the East Springfield, Mass. works of Westinghouse Electric & Mfg. Co. to the company's refrigeration department headquarters here, and has been appointed supervisor of public utility sales, according to P. Y. Danley, manager of the department. Since he joined Westinghouse in 1931, Mr. Newcomb has devoted himself to development of eastern metropolitan markets.

V. E. (Sam) Vining has been appointed supervisor of department and furniture store refrigeration sales, with headquarters here. He became associated with Westinghouse in December of 1933, and has spent the greater part of his time building up department store distribution.

Georgia Power Begins TVA Campaign

ATLANTA—Georgia Power Co. last week launched a nine-weeks sales drive on TVA-emblem appliances, which include refrigerators, ranges and water heaters.

The TVA appliances will be featured in all merchandising advertising.

Air Conditioned Mines May Speed Up World Gold Production

WASHINGTON, D. C.—That air conditioning of gold mines may help bring the world back to the gold standard was suggested by Rufus S. Tucker, an authority on monetary affairs at the Brookings Institution here, in commenting on the large air-conditioning system which has just been ordered from Carrier Engineering Corp., Newark, N. J., for the Robinson Deep Mine, near Johannesburg, South Africa.

Mr. Tucker's remarks were, "If air conditioning can become the means of increasing the production, the large South African output will be assured for years to come."

"This means that the world can go back to the gold standard, confident that its reserves will be ample to support any possible revival of trade, and this confidence will almost certainly cause commodity prices to rise."

The air-conditioning system planned for this mine will drive 400,000 cu. ft. of air a minute to the bottom of the mine, which is a greater air volume than supplied the R.C.A. building in Rockefeller Center. Its cost is estimated at \$1,000,000.

(Concluded on Page 6, Column 5)

Chrysler Conditioner To Retail at \$175

DETROIT—Amplifying the announcement made in last week's issue of the News that Chrysler has entered the air-conditioning field, details have just been divulged of the first of a line of products—a floor-type air-conditioning cabinet for summer and winter operation with a list price of \$175, without the remotely installed condensing unit.

President and chairman of Temperature Corp., the newly formed organization (offices in Chrysler building, New York City) which will market Chrysler air conditioners, is Walter P. Chrysler, Jr., 25-year-old son of the automobile magnate.

Associated with him in management of the new firm are two sons-in-law of Walter P. Chrysler, Sr.—B. C. Foy, president of De Soto Motor Corp. and E. W. Garbisch, advertising executive of J. Stirling Getchell, Inc., the agency which handles Chrysler advertising. Also on the board of directors of the new corporation is the elder Chrysler's youngest son, Jack Chrysler.

H. K. Jamerson, formerly director of advertising and sales promotion for De Soto, has been appointed general sales manager.

First public showing of the new air conditioner was made in the Chrysler building in New York City last week where several of the units were demonstrated.

(Concluded on Page 6, Column 1)

Public Learns about Porcelain Enameling



In the educational part of Porcelain Enamel Institute's exhibit at A Century of Progress the general public is shown how porcelain enamel is applied and fused into its metal base. This is done by means of a regular enameling furnace (at the left) and two spray booths, the furnace being used in producing souvenir ash trays.

Central System Cools 12 Apartments

FRESNO, Calif.—Valley Electric Supply Co. here has just installed a G-E central air-conditioning system in a Fresno apartment house owned by E. Wrought. Of two-story construction, the building has a total of 12 apartments with two double and four single apartments on each floor. Both floor plans are alike.

Closets of both floors were utilized for the ducts, the installers state. Splitter dampers are used in the double apartments to change the conditioned air delivery from the living quarters to the bedrooms. Duct work was done by the Standard Sheet Metal Co.

In the basement are installed a 10-hp. G-E Freon compressor (set to produce about 8½ tons of refrigeration), and six G-E evaporators with a capacity of 17,500 B.t.u. each.

Air is circulated by Sirocco centrifugal fans delivering about 3,000 cu. ft. of air per minute, with 30 per cent of fresh air supply. Seven feet above the floor of each room are 10 by 12-in. registers serving conditioned air.

There are 1784 sq. ft. of conditioned area in the house, with a volume of 22,300 cu. ft. A 15° differential below the outdoor temperature is maintained in the building.

1935 Crosley Radios Have New Receivers

CINCINNATI — New smartness in appearance and new standards in performance characterize the 1935 line of Crosley radio receiving sets just announced here by Powell Crosley, president of the Crosley Radio Corp.

Headed by a group of American-foreign band models including two all-wave sets, the new Crosley super-heterodyne line is one of the most comprehensive ever offered presenting complete series of dual range, standard band, battery, portable, automobile, motorboat, ac-dc, airplane and aviation ground station receiving sets.

In price they range from the ac-dc, portable Forty-One at \$19.99 to the deluxe 8-tube all-wave console model Eighty A.W. Lowboy at \$99.50.

The Crosley American-foreign band receivers are of 5, 6, and 7 tubes.

The 5, 6, and 7-tube sets have an American tuning band of 540 to 1720 kilocycles and a foreign broadcast band of 5,700 to 15,500 kilocycles. The two 8-tube models of the "all-wave" type, 530 to 24,000 kilocycles. These models range in price from \$39.95 to \$99.50.

With these highly selective, sensitive receivers it is possible for the listener to bring into his home entertainment from Madrid, Berlin, Buenos Aires, London, Rio de Janeiro, Paris, Rome, Moscow, Crosley radio engineers aver.

Other series in the 1935 Crosley line include dual range models ranging from the 5-tube Fiver deluxe at \$35 to the 10-tube Dual Ten Lowboy at \$79.50; standard band sets ranging from the portable ac-dc, Forty-One at \$19.99 to the Fiver at \$28.95; battery sets, from the Battery Forty at \$19.99 to the Battery Eight Lowboy at \$69.95; and the automobile and motorboat Roamio models "4A1" at \$28.98 and "5A1" at \$44.50.

'Gibson Girl'



Miss Dorothy Mae Pierce, Los Angeles, who won national contest conducted by Gibson dealers.

Leonard Distributor Opens New Branch

WICHITA, Kansas—Spurrier's Inc., Leonard distributor in Oklahoma City, has opened a branch office at 815 E. Second St. here.

As at the Oklahoma City headquarters, a complete warehouse stock of Leonard refrigerators is maintained at the new branch. Offices and warehouses are located in the same building, facilitating the handling of orders received from the 16 Kansas counties served by the organization. A complete Leonard display is also kept open for the use of Leonard dealers.

In charge of the new outlet is Warren F. Ryder, former head of Spurrier's order department in Oklahoma City. Service is in charge of L. M. Lovern. G. E. Marshall, the firm's Kansas representative, is also making the new branch his headquarters.

N. Y. Servel Distributor Named by Seilman

NEW YORK CITY—Majestic Refrigerator Corp., 916 Broadway, Brooklyn, has been named Servel distributor for Metropolitan New York, F. E. Seilman, president of Servel Sales, Inc., announces.

Majestic Refrigerator Corp. has served as Brooklyn distributor for Servel for a number of years.

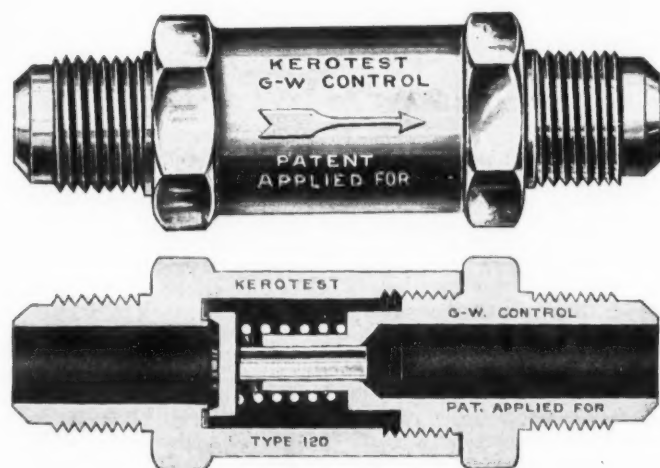
Drug Store Purchases Crosley Refrigerator

JERSEY CITY, N. J.—Appelo Radio Co., Crosley distributor at Newark, has sold a Shelvador electric refrigerator to Feinberg's pharmacy here, where it is used for the sole purpose of preserving insulin, antitoxins, etc.

Codes Which Affect Electric Refrigerator Manufacturers, Distributors & Dealers, And Fields of Related Interest

Industry and Address of Code Authority (Where Available)	Approved Code No.	Registry No.	Effective Dates
Electrical Manufacturing 155 E. 44th St., New York City	4	1308/ /10	Aug. 15, 1933
Ice 878 National Press Bldg. Washington, D. C.	43	126/ /01	Oct. 16, 1933
Pump Manufacturing 90 West St., New York City	57	1326/1/02	Oct. 22, 1933
Retail Trade 1027 Munsey Bldg., Washington, D. C.	60	1625/2/02	Oct. 30, 1933
Fabricated Metal Products Manufacturing & Metal Finishing & Metal Coating 729 15th St., N. W., Washington, D. C.	84	1118/ /06	Nov. 12, 1933
Washing and Ironing Machine Mfg. 80 E. Jackson Blvd., Chicago, Ill.	93	1399/1/11	Nov. 6, 1933
Machine Tool and Forging Machinery 1220 Guarantee Title Bldg. Cleveland, Ohio	103	1319/ /15	Nov. 19, 1933
Special Tool, Die, and Machine Shop 7016 Euclid Ave., Cleveland, Ohio	122	1149/ /23	Nov. 22, 1933
Valve and Fittings Manufacturing 420 Lexington Ave., New York City	153	1335/1/03	Dec. 20, 1933
Commercial Refrigerator 111 W. Washington St., Chicago, Ill.	181	1328/ /02	Jan. 1, 1934
Household Ice Refrigerator 205 W. Wacker Drive, Chicago, Ill.	183	1328/1/01	Jan. 9, 1934
Wholesaling or Distributing Trade 570 Seventh Ave., New York City	201	1625/ /59	Jan. 22, 1934
Coin Operated Machine Manufacturing 1608 Milwaukee Ave., Chicago, Ill.	228	1334/ /01	Feb. 2, 1934
Unit Heater and/or Unit Ventilator Mfg. 308 W. Washington St., Chicago, Ill.	272	1304/ /04	Feb. 19, 1934
Vacuum Cleaner Manufacturing J. P. Taggart, 1070 E. 152nd St. Cleveland, Ohio	317	1629/1/01	March 12, 1934
Beverage Dispensing Equipment 429 Terminal Tower, Cleveland, Ohio	334	1331/ /02	March 26, 1934
Insulation Board 333	1630/1/02	April 2, 1934	
Porcelain Enameling Manufacturing (Approved Code No. 84—Supplement No. 13)	84M	1033/1/02	April 10, 1934
Electric Refrigeration 155 E. 44th St., New York City (Approved Code No. 4—Supplement No. 1)	4A	1328/ /16	June 20, 1934
Radio Wholesaling Trade (Approved Code No. 201—Supplement No. 7)	201G	1327/3/03	May 1, 1934
185 N. Wabash Ave., Chicago			
Counter Type Ice Cream Freezer 814 Pure Oil Bldg., Chicago	418	1328/ /04	May 14, 1934
Steel Plate Fabricating Electrical Contracting (Approved Code No. 244—Supplement No. 6)	390 244F	1144/1/01 1211/1/08	April 16, 1934 April 30, 1934
Carbon Dioxide (Approved Code No. 275—Supplement No. 2)	275B	699/ /20	May 14, 1934
Plumbing Contracting (Approved Code No. 244—Supplement No. 9)	244I	1130/ /05	June 4, 1934
Warm Air Furnace Pipe and Fittings Manufacturing (Approved Code No. 84—Supplement No. 31)	84EI	1128/ /08	May 28, 1934
Flexible Metal Hose and Tubing Mfg. (Approved Code No. 84—Supplement No. 34)	84GI	1140/ /04	June 3, 1934

For better regulation of any refrigeration system



Actual size illustration of Kerotest Type 120 G. W. Control for 1/2" O.D. Tubing. Standard sizes also include 3/8" and 3/4" O.D. Tubing.

KEROTEST PATENTED G-W CONTROL

PREVENTS THE FLOW OF GASES IN THE SUCTION LINE FROM ONE COIL TO ANOTHER ON MULTIPLE INSTALLATIONS . . . ELIMINATES CONDENSATION OF WARM GAS IN A COLDER COIL . . . STOPS FROSTING OF THE SUCTION LINES . . . SHORTENS RUNNING TIME OF COMPRESSOR . . . MAKES POSITIVE TEMPERATURE CONTROL POSSIBLE . . . PAYS FOR ITSELF IN SHORT TIME.

The Kerotest G.W. Control is a highly developed and very sensitive suction line back pressure valve, so made that it will not interrupt the proper return flow of oil. It is ruggedly constructed to meet the most severe service demands of any refrigerator system. The materials are not affected by any of the refrigerants in common use, except ammonia.

The Kerotest G. W. Control can be used on any system, single coil or domestic, multiple installations, soda fountains, ice cream cabinets, beer coolers, etc.

These controls are not two-temperature valves. The delicate bronze coil spring needs no adjustment whatsoever. It is only strong enough to hold the valve seat in a closed position until the incoming pressure exceeds common suction line pressure. The pressure drop through the Control is very negligible if general rules regarding pressure drop are followed.

Write for descriptive literature illustrating a few of the many useful applications of Kerotest G-W Control

KEROTEST MFG. CO.
Pittsburgh Pa.



LOCAL REPRESENTATIVES

(Stocks Maintained for Immediate Delivery)

Atlanta, Ga., 285 Marietta St.	J. M. Tull Rubber & Supply Co., Inc.
Baltimore, Md., 108 South St.	Clendenin Bros., Inc.
Boston, Mass., 145 High St.	A. E. Borden Co.
Buffalo, N. Y., 64 Pashley St.	Root Neal & Co.
Chicago, Ill., 1342 Washington Blvd.	Kerotest Manufacturing Company
Cincinnati, Ohio, Burbank St.	Merkel Bros. Co.
Cleveland, Ohio, 1748 E. 22nd St.	Williams & Co., Inc.
Dallas, Texas, Jackson & Pearl Sts.	The Electromotive Company
Decatur, Ill., 133 Williams St.	Field & Shorb Co.
Denver, Colo., 14th at Lawrence	The Auto Equipment Co.
Des Moines, Ia., W. 11th & D.M.U.H.R.	C. L. Percival Co.
Detroit, Mich., 919 Holden Ave.	Refrigeration Accessory & Supply Co.
Fernwood, Miss., 711 N. Tangipahoa St.	Enochs Sales Co.
Fort Worth, Texas, 8th & Grove Sts.	Axtell Co.
Greensboro, N. C., 714 W. Market St.	Home Appliance Service Co.
Houston, Texas, 306 M & M Bldg.	D. C. Lingo Co.
Indianapolis, Ind., 229 E. South St.	F. H. Langenkamp Co.
Kansas City, Mo., 3833 Main St.	Forlund Pump & Machinery Co.
Los Angeles, Calif., 1015 E. Sixteenth St.	Kerotest Manufacturing Company
Milwaukee, Wis., 512 N. Water St.	Chase Brass & Copper Co., Inc.
Minneapolis, Minn., 145 N. 10th St.	Chase Brass & Copper Co., Inc.
Montreal, Que., Canada, 617 Craig St.	Railway & Engineering Specialties, Ltd.
Newark, N. J., Jefferson & Chestnut Sts.	McIntire Connector Co.
New Orleans, La., 813 Poydras St.	Enochs Sales Co.
New York, N. Y., 300 Fourth Ave.	Melchior, Armstrong, Dessau Co., Inc.
New York, N. Y., 43 Warren St.	Paramount Electrical Supply Co., Inc.
Philadelphia, Pa., 1516 Callowhill St.	Melchior, Armstrong, Dessau Co., Inc.
Pittsburgh, Pa., 901 Pennsylvania Ave.	Williams & Co., Inc.
Portland, Ore., 200 No. 13th St.	Harrison Sales Co.
San Francisco, Calif., 1077 Mission St.	California Refrigerator Co.
San Francisco, Calif., 380 Brannan St.	Refrigerating & Power Specialties Co.
Seattle, Wash., 314 Ninth Ave., No.	Harrison Sales Co.
Sioux City, Iowa, 2310 E. Eighth St.	National Refrigeration Service
Springfield, Mass., 592 Main St.	Home Utilities Co.
St. Louis, Mo., 3337 Market St.	Kerotest Manufacturing Company
Syracuse, N. Y., 314 W. Fayette St.	Syracuse Supply Co.
Toronto, Ont., Canada, 82 Ontario St.	Railway & Engineering Specialties, Ltd.
Vancouver, B. C., Canada	Fleck Bros., Limited

FACTORY REPRESENTATIVES

Chicago, Ill.	C. C. Taylor, 1342 Washington Blvd. (Local Stock)
Dallas, Texas	Clarence E. Barton, 215 So. Pearl St.
Dayton, Ohio	E. J. Kimm, 257 Springbrook Blvd.
Denver, Colo.	Monarch Sales Co., 1210 California St.
Detroit, Mich.	Thomas B. McLaughlin, 18273 Santa Rosa Drive
Los Angeles, Calif.	Van D. Clothier, 1015 E. Sixteenth St. (Local Stock)
New York, N. Y.	K. M. Newcum, 806 Graybar Building
San Francisco, Calif.	A. W. V. Johnson, Merchants Exchange Building (Local Stock)
St. Louis, Mo.	Robert H. Spangler, 3337 Market St.

FOREIGN REPRESENTATIVES

Australia	F. C. Lovelock, Ltd., 222 Clarence St., Sydney, N.S.W.
Europe and South America	Melchior, Armstrong, Dessau Co., Inc., 300 Fourth Ave., New York, N. Y.
Puerto Rico	Refrigeration Supply Co., P. O. Box 328, Ponce de Tierra, San Juan

G-E Builds All-Rubber Angle Plug

BRIDGEPORT, Conn.—To allow household electric refrigerators to be set flush against the wall, the merchandise department of General Electric Co. has developed a new all-rubber angle plug in which the prongs project at right angles to the cord. This overcomes the difficulty encountered where the appliance outlet is directly behind the refrigerator and a conventional type of plug is used.

With the new all-rubber plug a shallow design is attained since the contact prongs and leads are molded in rubber.

Another new development of the merchandise department is a cord set with the rubber connector body molded on the cord which provides a one-piece construction instead of the conventional three-piece construction. The long neck of the connector acts as a strain relief, eliminates possibility of breaking, and assures long life. Connectors may be molded on any type or length of cord.

Radio Association Defines 3 Classes of Sets

CHICAGO—The term "dual wave" has been eliminated by the Radio Manufacturers Association as an alternative definition for the "standard and short wave" radio set having a frequency range between 4,000 and 20,000 kilocycles.

The three classes of radio receivers which the RMA engineering division will define in detail are:

1. The "standard broadcast" receiver having a frequency range from 540 to 1,570 kilocycles to include recent extension of the broadcast band.
2. The "all-wave" receiver having a frequency range from 540 to at least 18,000 kilocycles.
3. The "standard and short wave" receiver having frequencies between 4,000 and 20,000 kilocycles.

Program of Expansion Celebrated by Alter

CHICAGO—Harry Alter Co. distributor of Grunow refrigerators and wholesaler of refrigeration supplies, held "open house" for northern Illinois dealers the week of June 9 in celebration of the firm's present expansion program.

A staff of outside wholesale salesmen appointed to cover northern Illinois under the direction of vice presidents Arthur S. Alter and Ben Mostow include Lee Litt, Jay Gordon, Gene Swartz, George Mishrock, Fred Schubert, Milton Schuldt, Nicholas Theisen, Jules Schneider, and E. B. Unger.

Large Shoe Store Buys G-E Equipment

AUGUSTA, Ga.—Saxon-Cullem Shoe Co., said to be the largest shoe store in the South, has just installed air conditioning, equipment for which it includes two 15-hp. General Electric compressors, one 3-hp. blower fan, and a 3-hp. centrifugal pump. Sale was made by A. R. Bruckner, division commercial salesman of the Georgia Power Co. The shoe store employs 50 clerks.

TEMPRITE Instantaneous Cooling

"The leading cooler for water, beer, and other beverages"

Write for Catalog

Temprite Products Corporation
(Formerly Liquid Cooler Corporation)
1349 Milwaukee East : Detroit

Grunow Shows New Radios to Dealers

CHICAGO—Sales executives and engineers of the General Household Utilities Co. here will within the next week complete their country-wide tour during which they are introducing the new Grunow all-wave radios to dealers. Six groups of factory men have been holding the meetings.

First team includes H. C. Bonfig, vice president in charge of sales; J. J. Davin, sales promotion manager; and Dr. J. D. Jordan, director of laboratories. They have already held meetings in Buffalo, Rochester, Syracuse, Albany, Hartford, Boston, New York City, Newark, Philadelphia, Baltimore, Washington, D. C., Pittsburgh, and Altoona. Remainder of their schedule is Binghamton, July 26; Scranton, July 27; Wilmington, July 30; Newburgh, July 31; Newport, Aug. 1; Plattsburg, Aug. 2; and Trenton, Aug. 3.

Cities visited by team No. 2, George W. Gaidzik and R. C. Ballard, are Huntington, Bluefield, Richmond, Norfolk, Winston-Salem, Monroe, N. C., Charleston, S. C., Atlanta, Jacksonville, Birmingham, Memphis, and Nashville.

Visited by Duane Wanamaker, advertising manager, and P. R. Butler are Columbus, Dayton, Cincinnati, Louisville, Indianapolis, South Bend, Grand Rapids, Detroit, Saginaw, Toledo, Cleveland, and Wheeling.

J. H. Rasmussen and F. H. McCarthy have made presentations of the new radio line in Milwaukee, Duluth, St. Paul, Dubuque, Davenport, Des Moines, Omaha, Lincoln, Kansas City, St. Louis, and Peoria.

Fifth team—Homer H. Kunkler and E. H. Sauer—has completed its tour, which included Wichita, Oklahoma City, Dallas, San Antonio, Houston, New Orleans, and Shreveport.

Carl D. Boyd and James Vultor have been in Los Angeles, San Francisco, Portland, Seattle, Spokane, Boise, Salt Lake City, Billings, and Denver.

Landers, Frary & Clark Gets Relief from Codes

WASHINGTON, D. C. — Landers, Frary & Clark, New Britain, Conn., manufacturer of electrical appliances, is one of the first manufacturers to be granted "relief" by the NRA in the problem of overlapping codes of fair competition.

Landers, Frary & Clark was subject to the following codes: electrical manufacturing, vacuum cleaner manufacturing, washing and ironing machine manufacturing, corrugated and solid fiber shipping container, graphic arts, silverware manufacturing, and non-ferrous foundry.

The solution recommended by the NRA granted exemption from all the above mentioned codes providing, among other things, the firm "complies with the provisions of the code for the electrical manufacturing industry in respect to all electrical goods; and, in respect to all other goods that can be segregated, from the standpoint of good business operation, with the provisions of the code for the fabricated metal manufacturing and metal finishing and metal coating industry."

Doorless Refrigerator Used In Norge Promotion Stunt

PHILADELPHIA — A doorless refrigerator placed in operation outside the showroom on hot days is the stunt which Scranton Talking Machine Co. of Scranton, Pa., Norge dealer, has been using successfully this summer. Trilling & Montague, Philadelphia distributor for Norge, has put out a special folder advocating similar promotion by other dealers in its territory.

Following are the instructions for carrying out the stunt:

Remove food compartment door and turn up cold control to highest point. Place thermometer (as large as possible) on the box or beside it so that the temperature reading can be easily seen.

The ice compartment with frozen ice cubes in the trays should be kept closed but passersby can open the door to see the frozen cubes. Appropriate signs in the lower half of the food compartment or on top of the box should call attention to the ice making capacity of the machine in the hot weather. The refrigerator should be kept in operation by means of an extension cord plugged into an outlet in the store.

18 Stewart-Warner Units Replace Multiple Job

ITHACA, N. Y.—Tremman, King & Co. of this city recently installed 18 model 454-A Stewart-Warner electric refrigerators in the Del Rio apartments here, owned and operated by S. A. Williamson.

The 4.6 cu. ft. individual Stewart-Warner cabinets replace a multiple system.



"...and honey, its got Dry-Zero insulation. That means it'll cost only about half as much to run. Whadaya know about that?"

Dry-Zero offers one of the best selling points any salesman of a Dry-Zero insulated job can use. It is the chief reason why a low temperature can be maintained in the box with a minimum consumption of current. Dry-Zero assures economical operation for the life of the refrigerator. If you want the complete story of Dry-Zero insulation, write for "What is Dry-Zero."

DRY-ZERO

REG. U.S. PAT. OFF.

THE MOST EFFICIENT
COMMERCIAL INSULANT KNOWN

Dry-Zero Corporation

CHICAGO
Merchandise Mart

TORONTO
687 Broadview Ave.

COMMERCIAL REFRIGERATION

Rochester, N.Y. Men Back American 'Z'

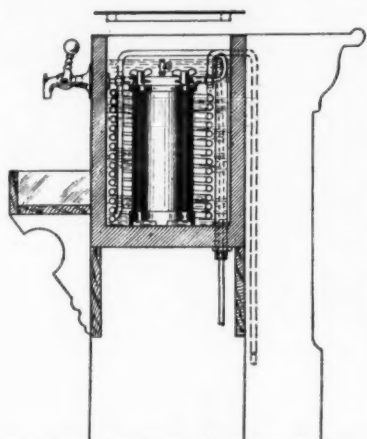
ROCHESTER, N. Y.—A number of business and professional men in this city have given financial backing to the American Z Corp. here, and some of the group have been made officers in the company, according to M. T. Zarotschenzeff, technical director.

The company merchandises the Z Process of quick-chilling and quick-freezing perishable foods such as meat, fish, fruits, and vegetables, which was developed by Mr. Zarotschenzeff. In this process, quick freezing takes place at from -4° F. to -6° F. All three methods of heat extraction are employed—radiation, conduction, and convection, the freezing occurring as a fine mist of sub-zero brine moves at high speed across the food, without the latter's being penetrated by the brine.

Mr. Zarotschenzeff asserts that the processes have been checked by the Liverpool Refrigeration Co., Ltd., and the U. S. Department of Agriculture.

New officers of the company are George E. Francis, president of the Rochester Chamber of Commerce, president; John F. Boylan, head of the Rochester Telephone Co., and Oscar H. Pieper, vice president of the Ritter Dental Co., vice presidents; Thomas L. McLeod, treasurer. W. M. Zarotschenzeff is secretary, and M. T. Zarotschenzeff retains his title of vice president and technical director.

New System



Beer enters the cylinder at the top, and is drawn from the bottom, in the BeeRcool system.

Commercial Cabinet Used To Preserve Blue Prints

CHICAGO—The Chicago branch of McCray Refrigerator Sales Corp. recently sold the Bruning Co., Inc. a large special chest and a condensing unit to be used in keeping blue print paper in perfect condition.

New Unit Cools Beer In Metal Cylinder

CHICAGO — A new beer-cooling equipment has just been designed by the Robert N. Baltz & Co. here, for installation in electrically refrigerated sweet water bath beer coolers.

Trade-named the "BeeRcool," this new cooler is built in the shape of a vertical drum for placement in the water bath, inside the circular refrigerant coil. The use of an alloy gives a higher rate of heat transfer than is possible with block tin coils, according to claims of the designer, Robert A. N. Baltz.

Beer to be cooled enters the top of the apparatus, and on coming in contact with the chilled metal of the cylinder runs down to the bottom from which it is drawn to the draft arm.

Exterior dimensions are 16½ in. high, 10½ in. deep, and 6½ in. in diameter (drum without connections). Capacity of the cooler is 104 oz. of beer. Net weight is 7 lbs. List price is \$30 per cooler.

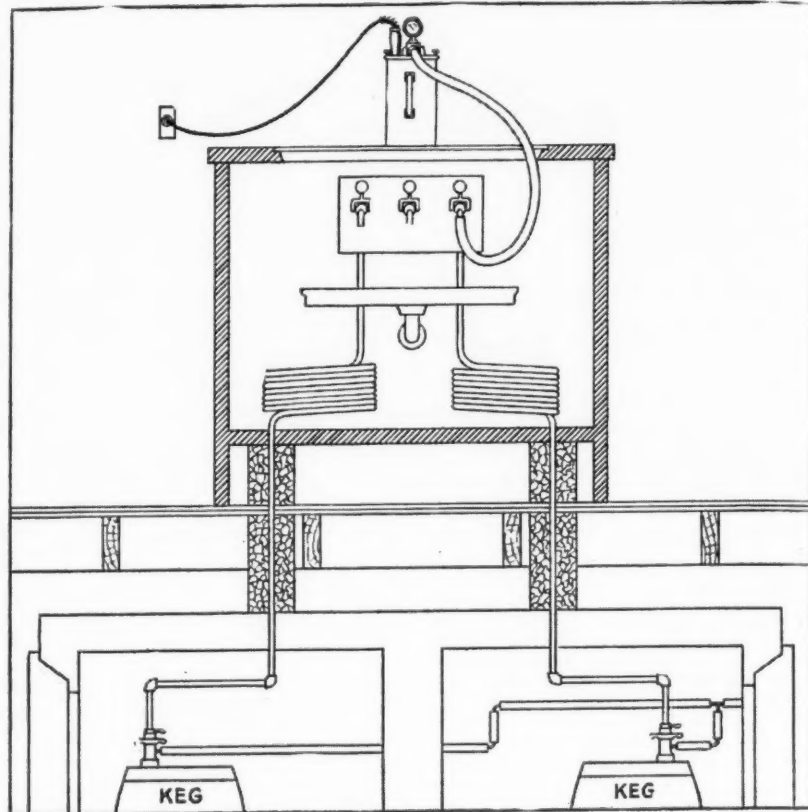
The Robert N. Baltz Co. is also selling portable beer-cooling equipment consisting of the BeeRcool cooler, faucet, tap, tapping tube, pump, 6 ft. of beer hose, and the necessary accessories and connectors without the barrel or bucket for No. 34.

Cutler Leaves Frigidaire N.Y. Organization

NEW YORK CITY—M. E. Cutler has announced his resignation from his position in the commercial and quantity sales divisions of the Frigidaire Corp. sales branch here.

Mr. Cutler has been connected with Frigidaire in New York City for the past 12 years, and previously had been active in the dairy machinery field.

Cleaning Beer Coils with Steam



Steam from the Steamsterile unit for cleaning flows from faucet connection through the coils, and comes out of other end, which is placed in some container. Tubing is disconnected at the top rod.

Portable Sterilizer Cleans Beer Coils

DAYTON—Steamsterile, a portable electric sterilization unit for cleaning beer coils, has recently been introduced by Steamsterile, Inc., of this city.

The new unit operates by merely connecting the electric attachment cord to any appliance outlet.

Steam is generated by means of an electrical immersion plate method of heating water. Engineers for the company claim that the conversion of electrical energy into heat is 100 per cent efficient.

The unit, which is cylindrical in shape, has a water tank constructed of steel tubing which holds two quarts of water. Water is poured in through a filler plug on top of the tank.

A rubber hose connects the steam outlet with the beer faucet. Ten minutes after the unit has been connected the operator opens the pet cock wide, to blow out stale beer and to heat the coil. After a minute or two he adjusts it to operate at 5 or 10-lbs. pressure, as he desires, a gauge on top of the unit allowing him to check his pressures.

The unit is equipped with a safety valve, to eliminate danger. Further, as the heating unit operates by making a contact with the water, the operator could leave the unit running after he had closed up the establishment, as the unit would automatically cease to operate as soon as all the water had been converted into steam.

The steel tubing tank is insulated and connected to virgin brass castings. The unit is jacketed with steel sheeting.

Assuming that the steam passes through the beer coil at 5-lbs. average pressure, the steam will expand to 40-cu. ft. volume. With the ¾-in. block tin coils usually used for beer, the 40-cu. ft. of steam would fill 52,000 ft. of such tubing.

Some of the steam condenses in the tube, thus supplying hot water which washes the interior surface of the tube.

Gloekler Makes Change In Organization

PITTSBURGH—The Bernard Gloekler Co. of this city, manufacturer of commercial refrigerators, announced last week that it is no longer affiliated with the Gloekler Mfg. Co. of Erie, Pa.

Time Record Claimed on Stockyards Installation

CHICAGO — Westinghouse commercial refrigeration equipment has been installed in the Coffee Shop of the Stockyards Exchange building, which was rebuilt and rehabilitated in a week after having been gutted by the great stockyard's fire last month.

Westinghouse equipment installed consists of a CWF-1501 1½-hp. compressor operating in conjunction with two Fedders forced convection commercial cooling units to refrigerate a walk-in cooler 14x10x7 ft.

G. I. Stadeker, manager, commercial department, Westinghouse Electric & Supply Co. of Chicago, claims a time record for the installation, which was completed in about 12 hours on the Sunday before the scheduled Monday opening of the coffee shop.

After the installation was completed, it was found that a mistake was made in the plumbing connections, but the plumber was located and succeeded in connecting the water lines with the main at 2 a. m. Monday.

Seeger Folder Spotlights Woman Marketer

ST. PAUL—"She Did the Marketing in the 60's—and more so than ever, does she do the marketing today," is the theme of a new promotional folder brought out by the Seeger Refrigerator Co.

"Your customer is a busy discriminating modern woman who through magazines and daily papers has become very conscious of the necessity of modern store equipment," says the promotional piece.

Handsome printed in many colors on heavy paper stock the folder shows various Seeger display case and service refrigerators, and spotlights various Seeger features.

Coesfeld Named Chief Rempe Engineer

CHICAGO—J. H. Coesfeld, for 23 years connected with the Baker Ice Machine Co. in Omaha, has joined the Rempe Fin Coil Co. here as chief of its engineering division, according to Gerald S. Bataille, Rempe's director of sales.



"with every Modern Feature...including RUST PREVENTION UNDER THE FINISH"

The modern family takes pardonable pride in its health-preserving refrigeration equipment, but how soon that pride begins to wane with the first sign of cabinet rust.

The new refrigerator may have every desirable mechanical feature. But once corro-

sion starts to eat its insidious way under the enamel or lacquer, destroying beauty of cabinet finish, mechanical perfection is soon forgotten.

Bonderizing under the finish prevents the start of rust and stops its spread from accidental abrasion. Bonderizing extends the life of cabinet

finish. It is an extra sales feature that can be used to tremendous advantage. It is a feature that indicates careful manufacturing, from ice trays to casters. It indicates a scientifically engineered unit, from motor to final finish. It assures a refrigerator of lasting satisfaction.

PARKER RUST-PROOF COMPANY, 2197 EAST MILWAUKEE AVE., DETROIT, MICH.



Parker Processes are the result of 18 years of continuous research, looking to improved technic of rust prevention and better finishes for iron and steel products. Literature describing these processes will be sent on request to manufacturers and technical men.

PARKER
RUST-PROOFING
processes



PARKERIZING • BONDERIZING

NOW!

A Real Dehydrating Oven Priced as Low as \$48 and up

Made in 1 and 2 unit sizes, of same quality as the standard Despatch Ovens, sturdily built to give long service and satisfaction.

Despatch C Ovens are now universally used by over 200 service stations. First cost low—operating cost low—guaranteed dehydration.

Complete Details sent BY MAIL.

We also build large dehydrating, primer, lacquer and dulux ovens.

DESPATCH OVEN COMPANY

623 S.E. 9th St.

Minneapolis, Minn.

REPRESENTATIVES IN PRINCIPAL CITIES



Despatch C-5 Oven

TVA Pamphlet Tells Objectives Of Its Appliance Program

CHATTANOOGA, Tenn.—One of the first of a proposed long series of promotion pieces to be issued by the Tennessee Valley Authority has just come off the press. It is a vest-pocket size pamphlet, and outlines the aims and objectives of the TVA movement, as follows (the following paragraphs comprise the complete pamphlet):

By order of the President of the United States in December, 1933, a new kind of governmental agency was created. It is known as Electric Home and Farm Authority. Its directors are the directors of the Tennessee Valley Authority, and it is allied in spirit and policy with that great national undertaking in the Tennessee River Basin.

The certificate of incorporation summarizes the objectives of Electric Home and Farm Authority. The agency was established, "to advance the general economic welfare of the nation" by developing and fostering an increased use of electric power through the double reduction of the cost of electricity to the consumer and the cost of electric appliances.

Electric Home and Farm Authority has obtained agreements from the principal electric equipment manufacturers of the country by which standard quality appliances are now manufactured for you at very low prices.

These appliances bear the TVA emblem. They are sold as other electric merchandise is sold through existing dealers who have made contracts with EH & FA. Sale of emblem appliances is restricted to communities served by electric utilities which in cooperating with the Authority have lowered their rates for current.

They are financed on term payments through the EH & FA finance plan, which permits purchase of a single appliance over a period of three years or less, and purchase of

two or more appliances over a period of four years or less. The interest rate on the unpaid balance of the cash-sales price is low. The down payment and monthly payment vary, but they cannot be less than \$2 down nor less than \$2 a month.

On an appliance, the emblem means that the product has been manufactured to quality standards set by EH & FA, that it is priced reasonably, and that it can be financed by EH & FA. Emblem appliances now are electric refrigerators, ranges, and water heaters. These appliances are on sale in the area of the Tennessee Valley.

Should you desire to purchase an emblem appliance, you would go to your regular dealer or retailer and select it. You would then sign a purchase contract and make your down payment.

The unpaid balance, including the finance charges, will be divided into equal monthly instalments and collected, by the electric company which serves you with electricity, at the same time you pay your light bill. The payments you make will be turned over to EH & FA by the electric company.

Electric Home and Farm Authority will maintain several display rooms and conduct demonstrations of the uses of electricity in the home and on the farm. But it will not sell or distribute appliances.

In order to be sure that the use of equipment such as electric ranges, refrigerators, and water heaters is feasible for householders and farmers of average income, Electric Home and Farm Authority must have a rate agreement with the utility serving the area before it will finance the emblem appliances.

The Authority must approve the domestic and farm electric rates as being sufficiently low to warrant a

wider use of house appliances. As the use of appliances increases and there is a much greater consumption of electricity in the home and on the farm, further rate reductions may become possible.

A wider use of electricity will mean that a great natural resource becomes a servant in your home.

Thus there are two major objectives of Electric Home and Farm Authority:

One—standard quality appliances reasonably priced;

Two—low electric rates for home and farm.

There is a third objective for which this emblem stands. That is a wider use of electricity through use of all electric appliances—those which bear the emblem as well as other equipment. The absence of the emblem on an appliance does not mean that it is not a part of this program of electrification.

By purchase of refrigerators, ranges, and water heaters which bear the emblem, families of average income may enjoy the full benefits of electricity. For other families larger sizes and different types may be more suitable.

"Electricity for All."

That slogan, appearing on the emblem, sums up the aim of Electric Home and Farm Authority.

Fulfillment of this aim is possible only by:

***obtaining reductions in electric rates through agreements with utilities, publicly and privately owned, so as to make the use of efficient, low-priced electrical equipment feasible for the householder or farmer of low or average income.

***By assisting in financing the consumer in the purchase of this equipment.

***By engaging in educational work in the use of appliances, and research to further lower the manufacturing costs of electrical equipment, and to still better adapt it to the needs of the average home and farm.

***By encouraging and stimulating the production of new and better designs in appliances.

***By assisting the manufacturers in their tests for quality and performance so that both makers and purchasers always will be assured that the approved appliances represent the best values manufacturers can produce at the prices asked.

Penn Switch Temtrol System Explained To Dealers

DES MOINES, Iowa—Penn Electric Switch Co. this week is holding the first of the series of dealer meetings which forms a part of its merchandising program on its new Temtrol system of automatic heat control.

Invitations are being sent out to all dealers in the territory, as well as to all utilities and manufacturers of heating equipment.

Part one of these dealer meetings will consist of a lecture, illustrated with charts, describing the Temtrol system. Part two will outline the advertising and promotional campaign which Penn Switch is introducing to promote its new product. Part three will present information on the installation and service of the Temtrol.

The fourth part of the program will follow the noon dinner. Lantern slides will be used to show dealers how they can tell Temtrol story to prospects.

Following is the schedule of meetings:

July 23, Eastland hotel, Portland, Me.; July 25, Kenmore hotel, Boston; July 27, Guards hotel, Hartford, Conn.; July 30, Taft hotel, New York City; Aug. 1, Broadwood hotel, Philadelphia; Aug. 3, Lord Baltimore hotel, Baltimore; July 6, Washington hotel, Washington, D. C.; Aug. 8, Ft. Des Moines hotel, Des Moines, Iowa; Aug. 10, Nicollet hotel, Minneapolis; Aug. 13, Pfister hotel, Milwaukee; Aug. 15, Stevens hotel, Chicago; Aug. 17, Statler hotel, Detroit; Aug. 20, Cleveland hotel, Cleveland; Aug. 23, Seneca hotel, Rochester, N. Y.; Sept. 5, Paxton hotel, Omaha, Neb.; Sept. 7, Muehlebach hotel, Kansas City, Mo.

EARNINGS

SCHENECTADY, N. Y. — Sales billed by all divisions of General Electric Co. during the first six months of 1934 amounted to \$80,983,093.60, compared with \$61,773,414.19 during the corresponding period last year, an increase of 31 per cent, President Gerard Swope has announced.

Profit available for common stock for the second quarter of 1934 was \$4,253,595.86, equivalent to 15 cents per share, or substantially the same as the quarterly dividend of 15 cents per share to be paid on July 25 to approximately 192,000 stockholders, compared with 10 cents per share paid to 184,000 stockholders a year ago.

Profit available for common stock for the first six months of this year was \$8,175,557.22, compared with \$4,666,080.69 for the first six months of last year. This profit is equivalent to 28 cents per share for the first six months of 1934, and 16 cents per share for the first six months of 1933, on 28,845,927 shares outstanding in both periods.

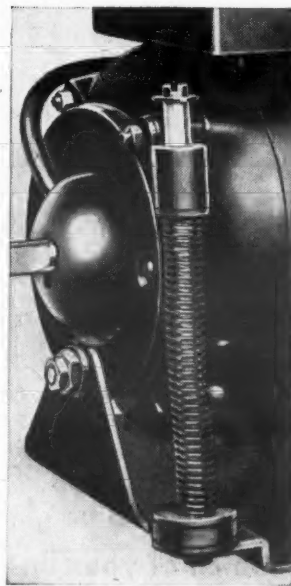
Orders received during the second quarter of 1934 amounted to \$54,005,988, compared with \$35,539,858 for the second quarter of 1933, an increase of 52 per cent. Orders received during six months amounted to \$92,154,642, compared with \$61,051,502 for the 51 per cent. The second quarter of 1934 was the largest since the third quarter of 1931.

Montgomery Ward to Build New Store

EVANSVILLE, Ind. — Montgomery Ward & Co. has completed plans for a new Ward department store here. The new building, to be erected at a cost of \$75,000, will be located at 517-521 Main St.



A FEATURE Typical OF DELCO VALUE—PATENTED AUTOMATIC BELT TIGHTENER



Note detail of belt tightener with snubber at top of spring.

The patented automatic belt tightener is a feature which typifies the value that Delco is building into its refrigerator motors. This new device consists of a spring which, by acting against the pull of the belt, maintains the proper tension to compensate for the stretch and wear of the belt. A snubber at the top of this spring provides just enough friction on the rod to rectify any variations in torque which might tend to make the motor oscillate. The development of this device is added evidence that Delco engineers are always improving their product so that it requires less and less care after installation, with consequent greater satisfaction to the refrigerator owner. This is one of the reasons why most of the better electric refrigerators in use today are Delco-powered.

DELCO PRODUCTS CORPORATION
DAYTON, OHIO

AIR CONDITIONING

Chrysler Conditioner To Retail at \$175

(Concluded from Page 1, Column 5)

onstrated in three showrooms on the ground floor of the skyscraper. The units will be manufactured in the Highland Park (Mich.) plant of Amplex Mfg. Co., a division of Chrysler Motors which makes non-automotive products such as industrial and marine engines, oil-less bearings, and portable air compressors.

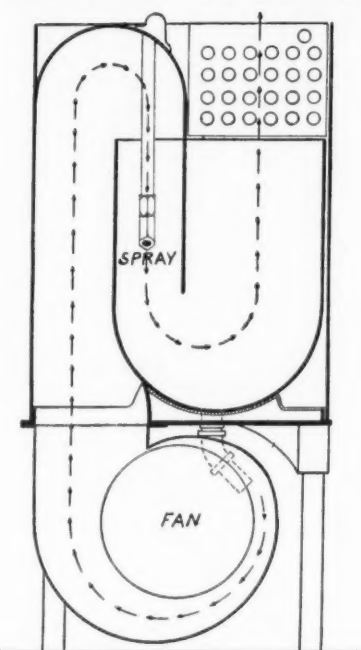
Chrysler air conditioners will be sold through distributing agencies to be established throughout the country. First distributor announced to date is the United Air Conditioning Sales Corp. which was organized to market the line in Metropolitan New York.

The Airtemp conditioner has been installed in a number of Chrysler offices in various sections of the country, as well as in the Chrysler buildings in New York City and at A Century of Progress in Chicago.

The cabinet stands 31 in. high, 15 in. deep, and 36 1/4 in. long. It is built of furniture steel, with a walnut grain finish of baked enamel. As shown in the end-sectional drawing at the left, two centrifugal fan wheels draw air into the conditioner from below, force it up to a baffle in the rear of the unit where its direction is reversed downward into a spray chamber.

Here a double spray washes and cleans the air with tap water, and the air passes up through coil sections and out into the room through a

End View of Airtemp



End section of Chrysler air conditioner showing location of parts.

straight-fin grille in the top of the cabinet.

Regulated by a needle valve, the spray nozzles consume about 1 1/2 lbs. of water per minute. The spray water is not refrigerated, but is intended

for washing in summer, and for humidification in the winter.

Driven by an 1/4-hp. Emerson motor with a double-shaft extension, the two fans deliver 600 cu. ft. of air per minute, with an air velocity through the grille of about 600 ft. per minute. Inlet and outlet air openings are surrounded by felt for quietness.

Standard arrangement of surface is a three-pass finned coil which is used for both heating and refrigerated-water cooling. When direct expansion of refrigerant is used, a separate single-pass coil for heating in winter is installed in the cabinet just above the larger coil. The conditioner may be used without refrigeration in communities where city tap water is cold enough to produce sufficient cooling when circulated in the coils.

The design of the Airtemp was instituted by Walter Chrysler, Jr. who became interested in the prospects of air conditioning as the result of an investigation in connection with Chrysler building in New York City, of which he is chairman of the operations committee.

The present thought of the company is to concentrate on installations in existing buildings where refrigerated water pipes are installed, and where circulation of refrigerant for direct expansion is restricted or a difficult installation problem. Therefore, the air-conditioning unit, without the decorative cabinet, is being made available separately. The unit alone is made of cold rolled steel, bonderized, with a baked black enamel finish. Unit size is 29 3/4 in. long, 28 1/2 in. high, and 13 3/4 in. deep.

Cooling capacity of the new conditioner is nominally one ton of refrigeration. (With 30 lbs. of 50° water being circulated through the three-pass coil per minute, and an 80° dry-bulb and 50 per cent relative humidity of the air, the unit is rated at 200 B.t.u. per minute). This can be increased by using a colder cooling medium and more coil surface.

Carrier Installation In Hotel Laid Out To Eliminate Noise

By Phil B. Redeker

DETROIT — Carrier Engineering Corp., Detroit branch, had to guarantee that it would meet three problems—proper air distribution with no drafts, elimination of noise and transfer of sound, and installation of the equipment without disturbing the operation of the hotel or its decorations—before the St. Clair Inn of St. Clair, Mich., would contract for an installation of air-conditioning equipment.

These three problems were met and conquered by Carrier engineers and equipment was installed to furnish comfort cooling for 42 bedrooms on the second floor of the two-story inn, four bedrooms on the first floor, the dining room, and the lounges.

The installation is of the central type, with a riser duct going up to the attic through closet space. This main duct is continued over a corridor. Doors to the bedrooms open onto the corridor from both sides.

Supply duct runners drop into a small box directly over the door in each guest room. These boxes are fitted with Carrier "Blue Ribbon" slotted high-speed diffusers. The diffusers throw the air into the room so fast that it mixes with the air in the room immediately, thus obviating any possibility of a draft.

The slots in the diffuser have been so arranged that they can be opened and shut in various combinations (by a device similar to that used in lowering or opening a hotel transom) so that the occupant of the room can "cut down" on the amount of cooling in any proportion desired.

Sound Transfer Problem

With such a series of interconnecting ductwork, it was absolutely necessary to eliminate all possibility of the transfer of sound and noises from one room to the next. This was done by lining all the supply duct runners with a seaweed material known as "Cabot's Quilt," which filters out any sound which might come into the duct.

A seaweed material had to be used, as it was necessary to find a sound absorber that would be impervious to moisture which might collect in the ducts.

The main duct in the attic was insulated against the abnormal attic heat.

Air is returned to the conditioner in the basement through a grilled opening in the corridor which leads to the return duct. Due to the fact that twice as much air is circulated to the rooms as is returned (due to the mixing of recirculated and outside air in the return duct) a pressure is built up, which forces the air through the louvred doors in the bedrooms into the corridors.

The four bedrooms on the first floor, the ladies' powder room and ladies' lounge, and men's grill and men's lounge, are served by supply duct runners in the same manner as the bedrooms on the second floor. No return ductwork is provided on the first floor, however, the conditioned air being allowed to spill out of the rooms and into the corridors.

Dining Room System

The main dining room, however, receives conditioned air from a supply duct which branches off the main riser duct. During meal times, by regulation of dampers in the ductwork, half of the air being circulated by the blower fan is diverted into the dining room. The dampers are regulated by means of a push button located on the first floor of the inn.

As mentioned above, fresh air and recirculated air are mixed in the return duct, the ratio being 50-50. From the return duct air passes first through a filter, and then over direct expansion coils, where it is cooled and dehumidified. An American Blower fan of the centrifugal type, rated at 8,000 c.f.m., drives the air up through the riser duct.

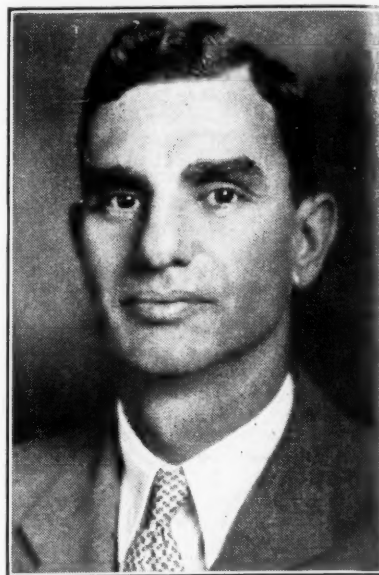
The coils are served by two 10-hp. Carrier Freon refrigerating compressors. The fan operates continuously from 3-hp. motor, but the compressors are controlled by a two-temperature thermostat located in the second floor corridor.

When the temperature rises to 80° F. one compressor cuts in. If the temperature should then rise to 82° F. indicating that the heat load was too heavy for the one compressor to handle, the other compressor cuts in. Carrier engineers declare air leaving the cooling coils is at a temperature of 50° F.

"This installation is designed to give maximum comfort to patrons of the Inn," declares E. S. Jones, manager of the local Carrier office. "A fresh supply of clean air is being fed to the rooms at all times, and when refrigeration of the air is needed, the system takes care of such a need automatically."

"With the 8,000 c.f.m. rating of the blower fan, we figure that each room is getting conditioned air at the rate of 150 c.f.m. Experts on ventilation problems have figured that if one individual gets air at the rate of 15 c.f.m. it is sufficient for his needs."

Leaves Grinnell



Thomas W. Carraway

T. W. Carraway Forms Own Engineering Firm in Dallas

DALLAS — Thomas W. Carraway has resigned from the management of the unit cooler dept. of Grinnell Co., of Providence, R. I. to organize the new Carraway Engineering Co. at 613 N. Pearl St. here.

Mr. Carraway is an engineer of broad experience in air conditioning for special processing and for human comfort, having been with Grinnell for two years, and with Schwitzer-Cummins Co., Indianapolis, previously. He participated in early developments of the unit cooler in Chicago in 1927, and has designed numerous automatic controls for refrigeration, including the Carraway automatic packless valve and an automatic defrosting device for unit coolers.

While in the Army he installed two refrigeration plants for the government at Camp Holabird in Baltimore and at Camp Normoyle in San Antonio, and since then has designed and supervised nearly 100 installations.

Carrier System to Cool African Gold Mine

(Concluded from Page 1, Column 4)

minated at about half a million dollars. Temperatures at the bottom of this mine ordinarily range from 100 to 120° F. with relative humidities from 90 to 100 per cent. It is expected that saving of life and health among the miners will increase their efficiency about 70 per cent.

Cooled air from the air-conditioning units will be forced into a tunnel which will bring the air into the mine shaft about 100 ft. underground. After serving its purpose at the bottom of the mine the air will be blown out to the surface.

Nearly half the world's output of gold is already being produced in the Rand district of South Africa in which the Robinson Mine is located, but heat of the earth has begun to limit the depths at which gold can be mined. It is believed that there are vast gold deposits below the present mining level, and with the aid of air conditioning, these may be tapped.

Buffalo Utility Installs System for Offices

BUFFALO — Cooney Refrigeration Co., Carrier distributor of this city, has just installed a year-round air-conditioning system for the Buffalo General Electric Co. to serve offices of the Niagara & Hudson Power Co.

The installation includes one 7 1/2-hp. and one 10-hp. Carrier methyl chloride condensing unit operating in a central system with Carrier coils (all in the apparatus room) to distribute conditioned air through Carrier slotted outlets in side walls of the conditioned room. Refrigerant is directly expanded.

Total volume of space conditioned is 21,000 cu. ft. with 5,600 c.f.m. blower adjusted with dampers to furnish about 25 per cent of fresh air continually. Indoor temperature maintained is about 78° F., with a relative humidity of 54 per cent.

Testing Service for Domestic and Commercial Electric Refrigeration

Testing and experimental laboratory service for Manufacturer, Distributor, Central Station. Test data exclusive property of client.

Electrical Testing Laboratories
80th St. & East End Ave.
New York

Fin Coils for Air Conditioning

WHEN the final check-up on this year's air conditioning installations is made, it will be found that **Bush Fin Coils** have played an important part in advancing the development of the business and in contributing to excellence of performance records.

Although most refrigeration and air conditioning requirements can be met

with our standard line* of finned tubing, there are applications that demand special coil construction. In such cases we are completely set up to take care of your needs quickly and economically.

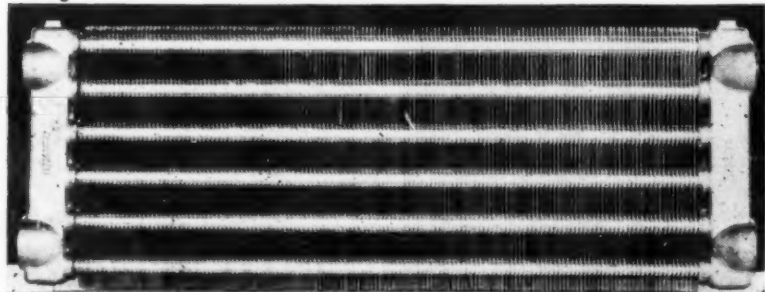
Whether your requirements are small or large, special or standard, Bush engineers will be glad to work with you on all of your fin tube requirements.

* Bush standard specification sheets list 38 combinations of fin and tube sizes and fin spacings. Let us send you the helpful data for your needs.

Bush Mfg. Co., Hartford, Conn.

489 Fifth Ave., New York City

6432 Cass Ave.,
Detroit, Mich.



610 N. Oakley Blvd.,
Chicago, Ill.

Unit Air Conditioners Fit Most Jobs, Says Westinghouse Dealer

By Thomas J. Charles
Vice President Metropolitan Air
Conditioning Corp., Westinghouse
Dealer in New York City

A UNIT air-conditioning system can be accomplished on any scale, large or small, at a considerable saving of expense compared to central plant equipment. Roughly, 60 per cent of a central plant installation runs to structural changes and sheet metal work, and disorder and discomfort always accompany an installation of this type.

Units Often Replace Radiators

As far as conditions found in metropolitan areas are concerned, the direct method of expansion featuring the unit system is best accomplished by the use of one compressor, or a number of compressors, remotely removed from the evaporators.

The obvious thing that lends itself to a speedy installation of the evaporators is to have them replace radiators where convenient, and to locate the compressors in a machinery room, where the law requires such, close to the source of water, waste, and power lines.

Care Required

Frequently you will find it necessary to replace radiators in concealed locations as, for example, behind marble radiator enclosures or behind enclosures constructed of expensive cabinet work.

The utmost care will have to be exercised when facing installations of this nature, particularly in view of the necessity of running the lines from the compressor to the evaporators where expensive molding or baseboard is encountered.

In our experience we have had to remove molding of marble, steel, mahogany, bird's-eye maple, rose wood, and walnut, and have even had to construct a false base to accommodate our lines in some installations where consent was not obtained to remove the baseboard or paneling.

Ingenious Installations

By and large, no two installations are the same, but the experience gained from one can generally be utilized in those that follow.

To accommodate two small adjoining rooms last summer, we set up a one-ton suspended unit on top of the molding of the partition separating the two offices, having removed one of the panes of glass and built a special shutter to deflect circulation into respective offices.

In a similar situation we have also utilized a one-ton floor evaporator and effected complete circulation by the installation of a grille top and bottom of the dividing partition. So even in simple installations there is an opportunity to ingeniously handle them differently.

The same goes for installations on a larger scale. It might be necessary to combine floor type and suspended type, some with heating elements and some without, as long as there is sufficient radiation present to take care of heating the space.

Steam Jet Refrigeration Utilized

Out of an experience of a good many years handling all types of refrigerating machinery and heating equipment, one is not beset with obstacles in planning the layout of the jobs we are called upon to figure. We are finding many opportunities to utilize the unit evaporators with the steam jet system where chilled water generated by the steam jet apparatus is utilized as a refrigerant.

This has a distinct appeal because of its positive nature, and in one installation in New York the copper fin radiation is utilized for both heating and cooling, hot water being used in the winter and chilled water in the summer.

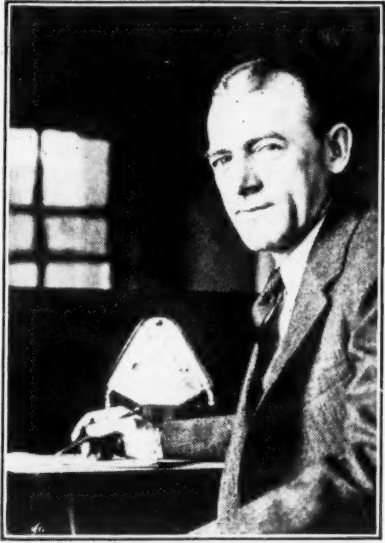
Well Water Can Be Used

The unit evaporators again can be used with well water where a well is brought in at a temperature low enough to give the desired effect of evaporative cooling. At present we are figuring on a job where an excess of brine is available, and we propose to utilize the brine, passing it through a heat exchanger and bringing up chilled water again as a refrigerant.

In this type of installation the appeal lies in the fact that the units may be located all over a building and piped to a central place in the basement as against a mechanical installation where we are generally limited in our activity to the equipment all being on one floor, the only exception being made where the ground floor evaporators may have a compressor in the basement.

In our territory at the present time water is so readily available that we are using water-cooled compressors to the exclusion of air-cooled which likewise gives us a quieter compressor, a feature that has a decided appeal where complete installations must be accommodated in heavily patronized, congested spaces.

Favors Unit System



Thomas J. Charles, Westinghouse agent in New York City tells in the article at the left how he applies unit-type air conditioners to different conditions.

Air-Conditioning System Combined with Heating Plant in Confectionery Store

DETROIT—In making the installation at the Fred Sanders confectionery store located at Grand Boulevard and Grand River Ave. here, the air-conditioning department of the local Frigidaire sales branch has demonstrated the manner in which a cooling system can readily be combined with an existing heating and ventilating system to provide year-round air conditioning.

Frigidaire equipment installed consists of two 10-hp. compressors and one 7½-hp. compressor, Frigidaire air-conditioning coils, and filters.

It was necessary to revise some of the ductwork in order to make the existing ventilating system suitable for summer air-conditioning purposes, according to W. E. McEwan, manager of the air-conditioning department, Detroit branch, Frigidaire Sales Corp.

For example, air was supplied by the ventilating system to the large one story confectionery floor by outlets in two architectural columns at the front of the store. The diffuser outlets were only 10 ft. from the floor, however, so the supply ducts were continued up the column to a higher

point, and Uniflow diffuser grilles placed in the columns.

The heating outlet was dampered off, and air diffused through the new grilles. In the winter, the upper grilles will be cut off by dampers, and the lower outlet opened.

Air is recirculated to the conditioning system by four return grilles located at the rear of the store. The existing ventilating system supplies outside air in enough volume to accomplish four complete air changes every hour. The blower fan is rated at about 9,000 c.f.m.

Air from the return duct is routed off into the cooling conditioning chamber, in which are located the direct expansion coils, filters and eliminator plates, by means of dampers. It is then returned to the main return duct at a point further along and is then sent into the supply duct by the fan.

In the winter, the cooling conditioning chamber is cut off from the main return duct by damper, and heating and ventilating is accomplished in exactly the same way it was done in former years.

7 Conditioners Placed In Edison Office

DETROIT — Seven Frigidaire self-contained air conditioners have been installed in the Second Boulevard office of the Detroit Edison Co.

Five of the conditioners, which are all of the ¾-ton refrigeration capacity type, have been installed in the utility company's library. Feature of this part of the installation, according to Sterling Sanford, Detroit Edison air-conditioning engineer, was that extreme quiet is necessary in the reading rooms. According to Mr. Sanford, the air conditioners make less noise than the oscillating fans which were previously used in ventilating the library. The other two conditioners were installed in the telephone switchboard room.

Chicago Burlesque Show Buys Air Conditioner

CHICAGO — The Star and Garter Theater, probably the oldest and most famous of all of Chicago burlesque houses, has installed a \$25,000 Frigidaire air conditioning system, replacing an old ventilating system.

A COOLING TONIC for frayed nerves!



"FREON"
Air Conditioning
soothes patients and
increases efficiency
of doctors and
dentists



If any place in the world requires a cooling, restful atmosphere—it is the office of a doctor or dentist! Here, patients must often wait . . . must then face trying ordeals with frayed nerves.

Certainly, air-conditioning can go a long way toward soothing tired nerves of patients . . . toward aiding the doctor in his work. Air-conditioning keeps the office cool and comfortable all year round, eliminates

air impurities, shuts out noise, safeguards health.

Many doctors and dentists have installed air-conditioning units in their offices. And the refrigerant they use is "Freon." It is safe, non-toxic, odorless. It assures comfort and maximum safeguard to health.

There are doctor's and dentist's offices in your city that need the comfort of "Freon." Tell those men about its advantages. And

there are other prospects for "Freon" either for refrigeration or air-conditioning, or both. These include restaurants, apartment houses and homes, meat markets and delicatessen stores, flower shops, photographic studios and storage vaults. The list is long—and "Freon" is the ideal refrigerant for all of these places.

FREON

REG. U. S. PAT. OFF.

a safe refrigerant



KINETIC CHEMICALS, INC., TENTH & MARKET STREETS, WILMINGTON, DELAWARE



Below: This doctor's office which is air-conditioned with "Freon" in Carrier Weathermaker equipment always remains cool and comfortable.

Above: Dentist office of Dr. E. H. Westenhaver, Kansas City, Mo. "Freon" air-conditioning unit by Frigidaire.

AIR CONDITIONING

How to Estimate Size and Costs Of an Air-Conditioning Job

Method of Determining Cost of Installation & Operation, Capacity and Type of System Are Explained

By H. P. Waechter*

Air-Conditioning Division, Brooklyn Branch, York Ice Machinery Corp.

ALONG with this year's increase in the demand for air conditioning has come a change in the type of equipment being offered—a change brought about, first by the development of Freon, and second by the type of jobs which now constitute the greatest potential field. This change is a trend toward simplification, toward small units, each with individual control.

It is a trend away from one big fan discharging air through large ducts to all parts of a building, and toward the use of many small fans blowing the air directly into the space they are to condition; it is a trend

away from the large air washer, conditioning the air for the whole installation, and toward the use of finned coil sections providing heating and cooling in a relatively small area, and assembled in a unit with its own fan and controls.

This change in trend is of real im-

portance because it opens up a tremendous portion of the air-conditioning field where highly specialized knowledge is not necessary for making satisfactory installations. It is a definite step toward the condition existing in the heating field, where every contractor figures his own job, and buys the equipment from the various manufacturers.

Here are a few figures to illustrate the shift in the field of greatest demand. These figures are for Chicago. Up to 1932, 176 air-conditioning installations had been made in the city. The greatest number in any single application was for theaters; second, offices; third, restaurants.

During the first eight months of last year, 120 installations were made, of which the greatest number were in offices, second came restaurants, with theaters a poor third.

Many Central Type Jobs Left

There remains a great deal of air conditioning to be done in theaters, and the central station type of plant will be used for most of them. There are few theaters compared to the number of restaurants, offices, specialty shops, barber shops, beauty parlors, taverns, tap rooms, grilles, bars, soda fountains, however.

That's where the field of air conditioning is today. Some of the large chains are definitely planning on air conditioning, and where they lead, all others must follow.

The figures for 1934 will show a far greater increase in the number of installations than in any previous year, and our past records show that more contracts are signed in June and July than in any other two months.

Restaurants Must Be Cooled

The attitude among some prospective buyers is that air conditioning is a very fine thing, but it costs too much and will be cheaper in a couple of years. Examine the logic of this argument. For an example consider a medium-sized restaurant, charging popular prices.

The owner of the restaurant, if he expects to stay in business, will be obliged to cool his store in summer—if not this year or next, then in two years or three. Sooner or later competition will force him to do this.

He therefore has to make this decision. Should he delay until he finds his business slipping away and then spend considerable money to stay in business, or should he have the jump on his competitors for at least one summer, during which time he will draw enough extra business to his place to pay for between 50 and 100 per cent of his installation?

Will Pay for Itself

The president of the Kresge Stores sums it up perfectly when he says: "Air conditioning installed now will pay for itself this summer—in two years it will just be a necessary expenditure."

Experience in restaurants has definitely shown that air conditioning does three things: increases the patronage, increases the size of the average check, and reduces the waste. The chef doesn't have to be a weather prophet in planning his menus.

Furthermore, it does these things when business would otherwise be at its lowest ebb—the summer slump. Summer can actually be made the most profitable season because the air-conditioned restaurant will be drawing business from others not so equipped. Many of these customers will be retained after the cooling season ends.

Results of Questionnaire

The May issue of the *Restaurant Management* carries the results of a questionnaire, that was sent to 50 air-conditioned restaurants. Thirty out of 32 reported increased patronage ranging from 12 to 100 per cent. The average increase was over 30 per cent.

Twenty-two out of 24 reported increased check averages ranging from 7½ to 38 per cent. The average check increase was 20 per cent. A conservative estimate of this increase of patronage would be 10 per cent and an average increase of five cents per check.

Records show that 45 per cent of the check is for the food and the cost of preparing it, and also that the average restaurant needs six times as many patrons during the day as there are seats.

For example, take a restaurant that has 100 seats. There will be 600 meals served daily at an average of 45 cents per check. The cooling season is taken at either 100 or 120 days. The first figure can be used to simplify the mental arithmetic.

The 600x100x.45=\$27,000 taken in during the summer season. Ten per cent of this is \$2,700 increase. With the average check going up to 50 cents, the increase is 66,000x.05=\$3,300.

The total increase of business is thus \$6,000. As previously stated, 45 per cent of this goes for food, so subtract 45 per cent of \$6,000, which leaves \$3,300, the net increase.

Against this charge the fixed and operating charges of the air-conditioning equipment.

The approximate cost of the installation will be \$4,000 and I will tell later how to arrive at such an approximate figure. The yearly charges, including operating cost and fixed

charges, average 20 per cent of the first cost, or \$800.

Subtracting \$800 from the net increase of \$3,300 leaves a clear profit of \$2,500 per year. The unit therefore pays for itself in about 1½ years, or, in other words, the return on the investment is 62½ per cent.

To be specific, let me give you some information about air conditioning that will be useful in your own field. Here are some figures on estimating the cost of a job that are the result of the experience gained from the many jobs installed by York:

These figures deal with the term, "tons of refrigeration." A ton of refrigeration is the cooling effect that would be derived from melting a ton of ice in 24 hours.

To make it easier to visualize, remember that it takes about one horsepower from the motor driving the compressor to generate one ton of refrigeration.

Also, think of the average-sized living room, say 14x20 ft., with four people playing bridge on a warm summer evening, the lights lit—the room will require about one ton of refrigeration to keep it comfortably cool.

How to Figure Capacity

To figure the capacity needed for a certain job, three factors should be taken into account: (1) Heat gained through walls, (2) The internal sources of heat and moisture, such as people, lights, coffee urns, motors, gas flames, etc.; (3) The infiltration of outside air.

Instead of going through these calculations, a very good approximation can be obtained by using the following method:

For a restaurant, 10 seats per ton. The cost of the installation varies somewhat with the size, so we can say that from three to five tons, the cost is \$450 per ton. From five to 10 tons, the cost is \$400 per ton. Thus, in the example used before, there were 100 seats, therefore, 10 tons. This times \$400 gave \$4,000 and is approximately correct.

In a retail store there are no seats to be considered. Two hundred sq. ft. per ton is used. Thus, if a store is 20 ft. by 60 ft., or 1,200 sq. ft., it would be a six-ton job. The cost per ton will run the same as for the restaurant.

In applying air conditioning to offices these factors are quite variable, but for a private office with two or three people, the figure 400 sq. ft. per ton can be taken. A larger office with several desks, figures the same as a retail store.

A guest room in a hotel runs about ¼ ton and costs about \$500 per room.

Operating Costs

Operating costs must be considered of equal, if not greater importance than initial costs, in any air-conditioning installation. While operating costs will vary somewhat in different localities, being influenced to some extent by local power and water rates, recent improvements in the design of air-conditioning equipment, tending toward increased efficiency, have appreciably reduced these costs.

Let us for example take 1½ gallons of condenser water per minute per ton. Figuring at 21 cents per thousand gallons, this comes to two cents per hour per ton.

At least 1 hp. per ton is needed which is the equivalent of ¾ kw. Figured at four cents per kw. hour, this is three cents. The total is five cents. The equipment does not run at full load all the time, and there will be times when it does not run at all. Experience shows that the average load factor is 50 per cent, the total

operating cost is approximately 2½ cents per ton per hour.

The next item is fixed charges. The cost is, say, \$400 per ton; take 10 per cent for amortization, four per cent for interest and one per cent for maintenance, making a total of 15 per cent, which is \$60 per ton per year, or 60 cents per day of the cooling season.

Based on an eight-hour day, it amounts to 7.5 cents per hour per ton. Add the 2½ cents operating cost to this, a total of 10 cents per ton per hour as the cost of owning and operating the plant is obtained. Change that back into the cost per year, multiplying by eight hours and 100 days, and you get \$80 which is 20 per cent of \$400.

Going back to the restaurant, figured at 10 seats per ton, therefore, the cost is 10 cents per hour, per 10 seats or one cent per seat, per hour. During meal times, two people occupy a seat during the hour, so it can be said the installation costs ½ a cent per patron.

Having determined the operating costs and prices, the principal parts of an air-conditioning system of this type should be reviewed. First, there is the compressor unit, mounted on a cast iron base and consisting of the two-cylinder compressor, the motor driving it by a V-belt drive, the water cooled shell-and-tube condenser, the motor starter, and the high pressure and low pressure cut-outs, for additional safety.

The compressed gas is carried into the condenser where the water circulating through the tubes condenses it into a liquid.

The liquid refrigerant is then piped through flexible copper tubing to the air-cooling unit, which consists of finned coils with a fan, a filter, a heating coil and a humidifying spray. The humidifying spray is used only in winter because in summer we want to lower the humidity of the air, not raise it.

The action of the liquid Freon in the cooling coils is very similar to that of water boiling in a tea-kettle. The water, in boiling, draws heat from the gas flame, and the refrigerant, in boiling, draws heat from the coils, which in turn take it out of the surrounding air.

As the air cools, condensation takes place. Thus, cooling and dehumidifying proceed simultaneously. The coils are so proportioned that the relative humidity will be kept around 50 per cent, and the automatic control will be set to maintain 80° F. inside temperature when the outside temperature is 95° F. For lower outside temperatures, the inside temperatures will be carried proportionately lower.

Type of Cooling Unit to Use

There is a choice of three general types of cooling units: the suspended ceiling type, the floor type, and the basement type with which duct work is used. Whichever type is selected, the cost will not be materially affected. The three determining factors are appearance, air distribution, and available space.

The matter of air distribution must be carefully considered and is important to know that air leaving an outlet at a velocity of 600 ft. per minute will carry the air to a distance of 20 or 30 ft., depending on the quantity of air. An outlet measuring ½ sq. ft. will throw 20 ft., and an outlet two feet square will throw the air 30 ft.

While considerable emphasis has been placed in this discussion on the various economic factors of the present air-conditioning picture, an effort has been made to show that there is no mystery in these factors when they are given careful analysis.

YORK REFRIGERATION • • AIR CONDITIONING

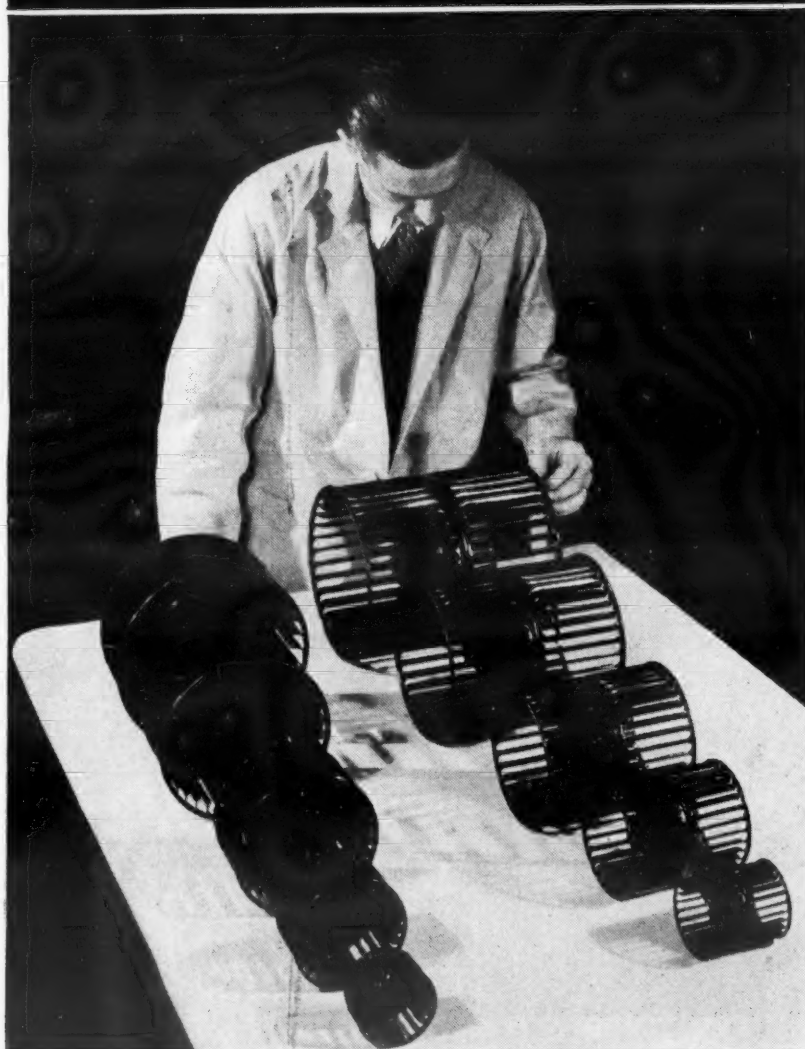
York builds a complete line of both Refrigerating and Air Conditioning Equipment—from the smallest to the largest in capacity—keeping pace with the ever widening field of application. York continues to expand its Sales and Service organization to meet the trend of modern times.

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Over fifty years' experience, quantity production methods and the finest equipment for the manu-

facture of multi-blade wheels for air handling enables us to produce these precision made wheels at unusually attractive prices.

You are invited to correspond with us regarding capacities, sizes, prices, etc. of wheels for oil burners, air conditioning units, driers, etc. There is no obligation. Address your inquiry to — Appliance Accessory Department.



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Please send data on wheels for—

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AIR CONDITIONING

Retail Chain Stores Show Keen Interest In Air Conditioning

YORK, Pa.—Large chain store companies of the country are now turning their attention to air conditioning, according to Stewart E. Lauer, general sales manager of the York Ice Machinery Corp.

"Many of these companies have had a number of their store units, those in key locations, equipped with air conditioning, and are studying the effect on patronage to determine future policy as respects all stores in their chain."

3 Drug Stores Conditioned

One company operating a large chain of drug stores has air conditioned three of its stores in Washington, D. C., with such beneficial results that it is probable they will install cooling systems in stores in eight states where the summers are hot.

Another chain store company, operating a national chain of popular priced shoe stores, has air conditioned one store in each of three sections of the country, New England, Middle Atlantic, and the Middle West.

Department Stores First

"In retail selling, department stores were the first to adopt air conditioning. Individually owned stores of the smaller type were quick to follow. But it was not until recently that the chain store companies began to show an interest," Mr. Lauer observed.

"One reason for this was that in the earlier phases of its development, equipment used in air conditioning was of a type which provided for permanent installation. In view of the fact that the great majority of the stores of the large chain store companies are occupied under lease, this type of equipment was not suitable for their use.

"The development in the last few years of the unit type portable air conditioner has provided equipment adapted to the needs of the occupant of leased property," he observed.

Hotel's Air Conditioning Publicized by Letter

DETROIT—To tell patrons about the installation of Westinghouse air-conditioning equipment for its meeting rooms and some of its guest rooms, Hotel Statler of Detroit has mailed a letter and folder to lists of prominent business men here.

A steam jet system supplies air conditioning for all of the dining rooms and meeting rooms, and for 50 guest rooms, each of which have individual-operated conditioners.

The letter accompanying the folder is as follows:

"Dear Sir:

"During the best of summers, there are days of sizzling heat—muggy, sticky days with high humidity. You'll be especially glad, then, to know you can go to the Detroit Statler where the weather is made to order.

"If you want to dine, entertain, hold a conference, enjoy a cool drink, or simply relax in a pleasant atmosphere, Hotel Statler, with its scientifically controlled temperature, is the place for you.

"But that's not all—you can sleep comfortably in a bedroom cooled by conditioned, filtered air. As you might expect, the Statler organization provides the first hotel with a group of bedrooms air-cooled by a permanent installation of this character.

"We want you to use and enjoy this newest feature of modern hotel luxury."

"P.S. Hotel Statler has more air-cooled space than any other hotel in Detroit. The enclosed folder tells the story."

15-Ton System Cools Fresno Coffee Shop

FRESNO, Calif.—A Westinghouse air-conditioning system has just been installed in Harry Coffee's men's furnishings store here. The installation was made by the Electric Construction Co.

A central system, the installation employs 15 tons of refrigeration capacity connected for direct expansion of Freon into two ES63 cooling coils on the balcony of the store. The system produces cooling, dehumidification, cleaning, and circulation for the 75,000 cu. ft. of space.

A system of ducts conducts the conditioned air from the cooling coils to air-distributing outlets located 10 ft. above the floor on outside walls of the store. Ducts were installed by the Standard Sheet Metal Co.

The control system is set to maintain a 20° F. temperature differential below the outdoor temperature, but not less than 75° F. Indoor relative humidity maintained is from 40 to 50 per cent. Fresh air is supplied for leakage only.

Hotels and Restaurants Say Air Conditioning Boosts Patronage

NEW YORK CITY—Almost unanimously reporting increased patronage and larger checks per customer, a group of air-conditioned restaurants and hotels have just been surveyed by the *Hotel Management Magazine* to determine their experience with air conditioning. Thirty out of 32 restaurants and hotels investigated reported increased patronage of from 12 to 100 per cent. The average increase in patronage was 30 per cent. Twenty-two out of 24 reported average increased checks, ranging from 7½ to 100 per cent. increases. The average of the group was about 20 per cent increase per check. A tabulation of results follows:

1. Do you have unit or central type equipment?	
Central	32
Unit	8
2. Does equipment supply complete air conditioning, including cooling and dehumidifying?	
Yes	29
No	3
3. Does equipment supply hot air in winter as well as cool air in summer?	
Yes	19
No	13
4. Who planned the installation of equipment?	
Own engineer	4
Consulting engineer	10
Equipment company engineer	31
(Note: Some installations installed by equipment engineer in cooperation with a consulting engineer hired by the owner.)	
5. When was installation made?	
1912	1
1920	2
1922	2
1925	2
1926	1
1927	2
1929	1
1930	1
1931	1
1932	6
1933	10
1934	4

*To March 1.		
6. What was the total cost of equipment and installation?		
\$10,000	\$ 3,200	\$38,000
5,200	3,700	6,500
4,500	2,700	900
5,000	12,000	5,500
2,700	60,000	5,500
1,526	2,800	25,000
2,900	3,700	7,500
6,000	1,400	
20,000	5,000	
4,500	1,400	
Average	\$9,152.81	

Average.....\$9,152.81			
7. How many days a year is the equipment in operation?			
155	365	150	365
300	365	120	365
185	365	120	365
220	120	365	140
365	120	365	150
220	220	120	
62	365	150	
365	120	365	
141	120	365	
90	220	300	
Average.....		237	

Average.....237		
8. What is the opening cost per day?		
\$4.00	\$ 1.00	\$ 7.00
8.00	10.00	15.00
50	7.00	5.00
7.50	7.00	2.00
7.00	8.00	6.00
2.50	1.00	4.60
1.00	1.00	
10.00	3.00	
6.75	3.00	
1.50	1.00	
Average.....	\$5.00	

Average.....\$0.00	
9. Have expensive repairs been necessary?	
Yes	1
No	35
10. Increased patronage and increased check size?	
a. Increased patronage:	
Yes	30
No	2

b. Percentage increased patronage:			
12%	22%	50%	35%
25	30	100	50
25	20	20	
25	20	35	
25	40	20	
Average		22%	

11. Are you satisfied that the equipment was a good investment?	
Yes	35
No	2
12. Do you favor air-conditioning equipment including both cooling and dehumidifying?	
Yes	34
No	34
13. Do you favor complete air conditioning to be used both winter and summer?	
Yes	30
No	5

14. How large does a restaurant have to be to justify installation of air-conditioning equipment?	
27 replied that all restaurants should have it regardless of size.	
2 said from 50 seats up.	
1 said from 100 seats up.	
2 said from 150 seats up.	
1 said from 200 seats up.	
1 said from 300 seats up.	
2 said that the character of the establishment should govern and not the size.	

VIRGINIA SMELTING Company
WEST NORFOLK, VIRGINIA
76 BEAVER ST., N.Y. - 131 STATE ST. S.W. - OKLA.

Extra Dry
ESOTOO
LIQUID SULPHUR DIOXIDE
V-METH-L
METHYL CHLORIDE

New Orleans Electrical Appliance Display Home



Night view of the New Orleans home which houses a cooperative electrical appliance display.

NEW ORLEANS—The latest ideas in home comforts as provided by modern electrical appliances are demonstrated in New Orleans' "House of Tomorrow," a model home recently opened to public inspection by the Electrical Association of New Orleans.

This demonstration house was not built for this particular purpose, but was a residence that had been constructed some years ago, and is designed to serve as an example of what can be done with an already existing dwelling by the installation of modern appliances and furnishings.

Kitchen, pantry, and breakfast rooms of the New Orleans "House of Tomorrow" are ultra-efficient departments in the food production line. Every table and kitchen appliance that would facilitate the preparation of food has been placed in the kitchen and breakfast room.

Air conditioning is another feature of this modern exhibition home. The

entire first floor is equipped with units, one to a room, while the compressors are installed in the basement, and may readily be inspected there. Frigidaire, General Electric, Ilg, Strang, and Westinghouse air conditioning equipment is used.

In the attic there has been installed an attic ventilating fan, furthering the cooling effect and demonstrating how these two types of cooling and ventilating equipment could advantageously be used conjunctively for the best effect.

A specially constructed radio room has been located in the attic and, through the cooperation of the New Orleans Music Dealers Association, numerous models and types of the latest radio receiving sets have been placed on display. Every room in the house is also equipped with a radio.

The entire basement has been converted into a display room in which standard makes of automatic refrig-

erators and water heaters are exhibited. A model laundry complete with various types of electric washers and gas laundry stoves, and electric ironers, and small hand irons for the more delicate clothes, is located in the rear of the basement.

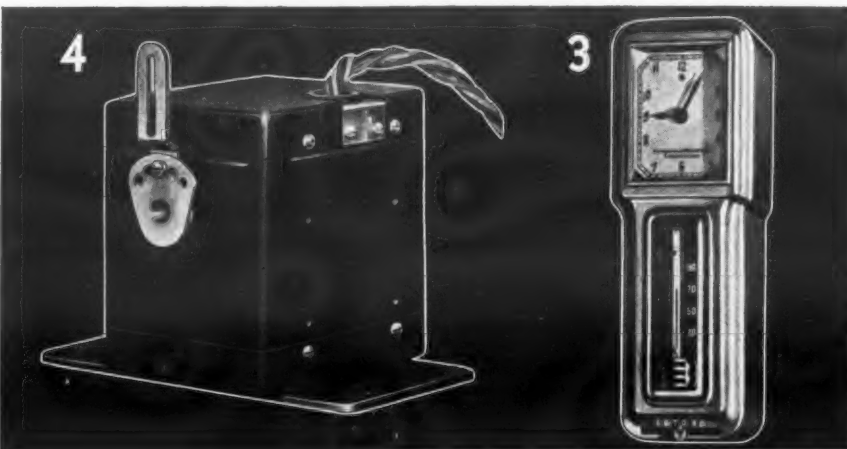
As a novelty feature, several scientific electrical novelties such as the photoelectric cell (electric eye) which counts the people as they enter and also affords drinking water by merely bending over the fountain, are contained in the home.

The New Orleans "House of Tomorrow" is open daily from 3 to 10 p. m. during the week, and from 10 a. m. to 10 p. m. on Sundays.

The Electrical Association has employed newspapers, radio broadcasting, billboards, direct mail pamphlets, street car cards, and electrical signs in publicizing the "House of Tomorrow."

Air Conditioning Depends on PROPER CONTROLS

WITHOUT proper controls much of the effectiveness of air conditioning, with its many applications and exacting requirements, is lost . . . Minneapolis-Honeywell Air Conditioning Controls are specifically designed to meet every air conditioning or cooling need. Each individual control operates in perfect harmony with other controls comprising the system and accomplishes its particular function with characteristic Minneapolis-Honeywell accuracy and efficiency . . . To insure complete satisfaction with any air conditioning job recommend and install Minneapolis-Honeywell Controls. The Minneapolis-Honeywell Engineer, in or near your city, is available for consultation with your engineer at all times. Minneapolis-Honeywell Regulator Company, 2807 Fourth Avenue South, Minneapolis, Minnesota.



1. REMOTE BULB TEMPERATURE CONTROLLER. For duct temperature regulation and other applications where remote control is necessary. 2. HUMIDITY CONTROL. For accurate regulation of relative humidity. 3. THE CHRONOTHERM. Maintains temperature within a fraction of a degree at all times and automatically raises and lowers morning and night temperature level to meet demands of occupancy. 4. MODUTROL MOTOR. Maintains valves, dampers or louvers in precisely the position needed to produce the exact flow demanded by requirements. 5. MAGNETIC WATER VALVE. For regulating water flow for humidifying, cooling, or cleansing.

MINNEAPOLIS HONEYWELL

Control Systems

ELECTRIC REFRIGERATION NEWS

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Preparedness Against The Strike Hazard

TELEPHONE calls to various manufacturers during the last week confirmed our supposition that shipments of electric refrigerators to the San Francisco area have been held up while the general strike was in progress. Factories have had carload orders from their San Francisco agencies on hand, but were advised against filling them until the storm blew over. Local advertising of electric refrigerators in the strike area is said to have been considerably curtailed; the making of deliveries in that territory, of course, was handicapped, and was for a time stopped altogether.

One unforeseen and certainly fortuitous result of the general strike has been the creation of an increased desire for electric refrigeration among the families living in the strike area. When the ice wagon doesn't come around for days and days, housewives who still have ice refrigerators are bound to get exasperated.

Multitudes of San Francisco families are said to have stocked up heavily on foodstuffs when it began to be noised about that a general strike was forthcoming. Families which possess larger-sized electric refrigerators got along quite comfortably during the strike. But those with ice refrigerators in a good many cases, had to sit back and watch their stocks of foods spoil. The next time an electric refrigerator salesman comes to one of these homes, he will probably find the housewife ready to listen to his story.

And present users of electric refrigerators in San Francisco should be more enthusiastic than ever. Salesmen can "use the user" now with great effect, as the owners have had a dramatic demonstration of the value of having their own means of food preservation in their own homes and under their own control.

Even though some behind-each-cloud-there-is-a-silver-lining statements like the above can be made about the San Francisco general strike and its relation to the refrigeration business, there can be little doubt that business has been very seriously damaged by the strike. The fact alone that hundreds of thousands of men have taken themselves off payrolls, voluntarily or because of pressure, is an indication of the more difficult task now faced by electric refrigeration dealers and salesmen.

Just as all participants lose from a war, so all concerned suffer from a strike. Even though the demands of the longshoremen who started the whole thing out in California may have had their merits, so many people have been discommoded and so many lost real money as a result of the general strike that public opinion is bound to grow against the labor agitators. A general strike ceases to be a conflict between labor and employer; it becomes a fight between labor and the general public. And organized labor all over the country will probably pay the piper for the bad judgment of their brethren out in California.

Whether or not the bad effects of the general strike in San Francisco will tend to discourage

the launching of other strikes in various parts of the country remains to be seen. The chances are that the adverse public opinion engendered by this strike will at least act as a deterrent on labor leaders who have been gathering their forces for similar tests of strength. But in any event, the electric refrigeration industry appears to be well entrenched against the exigencies of such a situation.

Anticipating last fall the imminence of strikes, manufacturers began laying plans for extra production, and for warehousing this surplus. This foresight turned out luckily, for—although the industry was not plagued with strikes—the greatest buying rush in the history of refrigeration taxed production capacities to the limit this spring. Now that factories have begun to catch up with orders, however, manufacturers are planning to warehouse surplus stocks as a protection against the possibility of strike interference in the fall.

Labor has received a good break from the refrigeration industry in the last several years, having kept men at work all through the depression. Many of the manufacturers have gone to considerable lengths to promote better management-employee relations, and have had employee welfare so much at heart that an exceedingly good feeling toward management exists in their plants.

And now that the public has had a sample—in the San Francisco situation—of the damage a strike can do, and the lengths to which it can go, prospects for immediate labor disturbances in the refrigeration industry appear comparatively remote. Agitators who may cast eyes on this industry as a possible field for their peculiar brand of exploitation and extortion should also take notice of the elaborate precautions refrigeration manufacturers have taken against such an emergency.

One reassuring feature of the whole situation is the observation that, in the past, the widespread prevalence of labor trouble following a depression has been a dependable harbinger of returning prosperity. Sympathetic understanding seems to be promoted by hard times; but when business prospects are good, men start quarreling over the distribution of the future profits.

WHAT OTHERS SAY

Goal of Ambition

SHALL the small business man be forced out of the American scheme of things? Prof. Kenneth Dameron of Ohio State University posed this question at a dry goods code meeting in Chicago, saying it was the vital problem which business and the NRA faced.

From the social view there can be little question that the small enterpriser plays an indispensable role in every community.

His position in life represents the goal toward which millions of employes strive. The fact that for generations this goal has been reasonably attainable has contributed much to national well-being and contentment.

The clerk today works efficiently and obediently because tomorrow he hopes to run his own store; the engineer and craftsman save to become independent contractors; the waiter thinks of the restaurant of his own he will open. Nearly every American dreams of some day becoming his own boss, and those who do achieve relative independence seldom willingly relinquish the status.

It is good that this should be so, and unthinkable that it should not be. To destroy for members of the rank and file their hopes of some day going into business for themselves would mean destroying the motive for a great deal of American spirit, energy, and initiative. It would be a shocking mistake.—*Detroit Free Press.*

Will the Public Pay the Price?

ONE immediate result of the attempt to raise prices is a decrease in volume, if not in dollars, at least, in units of work—both, in many instances. The printer, who had hoped for "things to open up" when the code became effective, now finds himself in a worse struggle than before. While rustling together higher payrolls, he has to readjust his organization and expense of operation to come within the prices he is able to obtain. This is doubly difficult because his "old landmarks" are destroyed and he finds himself in a sea of confusion. How long printers with little or no surplus can stand up under the strain remains to be seen.

The supreme test lies before us during the next few months. Regimentation of industry, in matters which lie wholly within itself, may not be so difficult. It may even put on a good parade, and be cheered by the music of its own band. But, compelling the public to pay for the uniforms and the price of admission is another matter entirely.—*The Inland Printer.*

LETTERS

Dillinger Post Script

Stauffer, Eshleman & Co., Ltd.
Norge Refrigerator Distributors
New Orleans

Editor:

A few days ago I was whacking the bushes in North Louisiana for new dealers and came in time to the town of Natchitoches, heretofore virgin—as far as Norge was concerned. Had my trusty cutaway Rollator with me and is my wont I first ambled into the three banks and interviewed their respective cashiers or presidents on the financial worth and aggressiveness of the potential dealers I intended to call upon.

On leaving the first institution I casually noted that the town's police force eyed me and my cutaway with what I thought to be idle curiosity; however, on leaving the next bank I thought it more than a coincidence that "the force" should be patrolling the building's entrance at the time of my departure and when I started down the street to the last bank and glanced over my shoulder only to see "the law" just a few steps behind me I began to wonder as to what might be up.

While waiting for my last interview it occurred to me that perhaps the bird figured my cutaway with its exposed hollow shaft and flywheel with inset handle to be some sort of new-fangled machine gun, and while my pride would not permit me to convince myself that I looked the part of a bank bandit, still...

Anyway, when I finally did get to talk to the cashier I voiced my suspicions to him and inasmuch as the cop was still parading past the front door he called him in. Well sir, Mr. Law came in with drawn pistol and ready for any emergency. When questioned he readily admitted that the cutaway Rollator aroused his suspicion and this suspicion became strengthened into more definite form when he saw me head into the first bank. It seemed that a bank in a small town about 40 miles to the south of Natchitoches had been "stuck up" a few days before by a bird who (naturally) was claimed to resemble Dillinger, and, soo-OO-OOO!

The upshot of it was that the cashier promised to have his (the "force's") salary raised for this exhibition of alertness, and I resolved, then and there, to recommend Norge's immediate institution of a heavy educational campaign in all small town weeklies in North Louisiana in an attempt to get the story over to the populace that a cutaway Rollator is a dismantled cold-making machine and not a Browning in a new form! For the next cop may decide to shoot first and investigate afterwards!

Or failing in this endeavor I shall certainly have a sign painted to affix to my back which shall read something like this: "Don't Shoot—I Ain't Dillinger."

GEO. H. LEHLEITNER.

Articles on F-12

Bridgeport Brass Co.
Bridgeport, Conn.

Editor:

About a year ago you published several articles discussing the good and bad points of F-12 refrigerant.

If it is possible for you to do so, we would greatly appreciate your informing us the dates these articles were run, as our copies of ELECTRIC REFRIGERATION NEWS are filed in a vault, and we do not know just where to look for these particular numbers.

R. C. SAWYER,
Fabricating Development.

Answer: We've published a number of rather extensive articles on various tests to which this refrigerant has been subjected, and can't tell definitely just which you have in mind. The first and most complete article, published in our Dec. 20, 1931 issue, described the results of a series of tests conducted by Kinetic Chemicals, Inc. at Deepwater Point, N. J.

Then there was an article in the June 29, 1932 issue which reported a vigorous opposition to adoption of this refrigerant headed by Fremont Wilson, consulting engineer of New York City.

Quite a thorough series of tests of all refrigerants made by the Underwriters Laboratories was reported in the issue of Jan. 24, 1934.

Air-Conditioning Franchise

R. E. Swope
909 Second National Bank Bldg.
Cincinnati

Editor:

Can you advise me of a manufacturer of air-conditioning equipment, who would be interested in being represented within a radius of 100 miles of Cincinnati?

I have been a representative mainly of radio manufacturers, in this territory for the past eight years, and know the trade well. I have some good outlets for the proper equipment immediately.

R. E. SWOPE.

Windel Has a New Job

Ohio Edison Electric Shop
Corner Boardman & Champion Sts.
Youngstown, Ohio.

Editor:

Please change my mailing address on ELECTRIC REFRIGERATION NEWS from 511 East Wells St., Milwaukee, Wisconsin, to Ohio Edison Electric Shop, Corner Boardman & Champion Sts., Youngstown, Ohio.

In making the change from Milwaukee to Youngstown I have missed four issues of the News and I would like to have the last four copies sent to me along with the regular delivery.

CARL W. WINDEL.

Commercial Refrigeration Mgr.
P.S. Just can't be without the News, so give the above prompt attention.

Editor's Note: In 1931, Mr. Windel was a salesman for the Coughenour Radio Electric Store in Springfield, and in that year earned the title of Copeland national sales champion. Later he joined the Frigidaire sales operation in Milwaukee. On page 8 of the Jan. 27, 1932 issue of ELECTRIC REFRIGERATION NEWS is a "how" story describing Mr. Windel's sales methods.

Valuable Surveys

Specialties Distributing Company
Detroit, Mich.

Editor:

We have intended for some weeks past to drop you a note of appreciation for the very valuable dealer and distributor survey obtained through the traveling efforts of your Mr. Elston Herron.

We followed his articles with much interest and obtained in a few minutes reading an authentic picture of what was going on in other sections of the country.

The reaction of refrigeration dealers throughout the country to the new low-priced TVA refrigerators will be most interesting. We sincerely hope that Mr. Herron will be able to continue his travels and keep us up to the minute through the columns of your excellent paper.

LEONARD F. TURNBULL.

Studied by All

R. Cooper Jr., Inc.
221 North La Salle St., Chicago

Editor:

I feel sure that your publication is read, and perhaps studied, by every individual in the refrigeration industry—of course, I refer to ELECTRIC REFRIGERATION NEWS.

S. NIDES,
Manager,
Sales promotion department.

Standard Discounts

Juan F. Robiola
Santiago (Chile)-Milan-Buenos Aires
Rivadavia 1128 - (3er. Piso)
U. T. 38, Mayo 3467

Editor:

Would you be so kind as to advise me the approximate discounts accorded to retail dealers, distributors, and wholesalers on domestic refrigerators in the territory of the United States on list prices.

As I am not a buyer, I should like you to give me the details without any obligation on my part, no names or makes need be mentioned if you do not wish it. My object is to compare the retail dealer and wholesaler's margins with other lines, for statistical purposes in this country.

J. F. ROBIOLA.

Answer: Discounts on standard household refrigerators sold in the United States run from 50 per cent to 60 per cent of the list price to distributors, and from 30 per cent to 40 per cent of the list price to dealers. Discounts vary not only among different manufacturers, but also according to the size of the model. Generally speaking, the larger the refrigerator the longer the discount.

On the new chest type models, designed to retail for less than \$80 at the express order of an agency of the United States Government, distributors receive approximately 33 per cent off list price, and dealers 25 per cent.

The cost of distribution of electric refrigerators in this country is a very material item of expense, which is approximately equal to the cost of manufacture. Considerable attention has been directed toward the cost of distribution, and there is a feeling on the part of many people that distribution costs are entirely too high as compared with the cost of production. It may be that this criticism is justified in some lines.

Notable experiments have been made by large concerns, which have endeavored to reduce the cost of distribution by selling direct to the public, selling direct to the dealer, and various other short-cuts. It seems to be the universal experience that the various necessary functions involved in the movement of goods from the producer to the consumer all total up to a more or less fixed percentage of the production costs, regardless of the method of distribution.

In other words, it costs money to warehouse a product, to finance dealer stock, to carry on retail sales, etc., regardless of whether these functions are performed by one organization or divided among several independent specialists.

Strike Slowed Up Sales and Halted Deliveries in San Francisco, Distributors Report

Commercial Sales Suffer

Electric Appliances, Inc.
San Francisco, Calif.
July 19, 1934.

Editor:

The San Francisco strike greatly reduced our commercial refrigeration sales. It practically stopped sales of equipment to restaurants selling low-priced foods and the agitation in the rural districts kept many prospective purchasers in the country from buying.

In the Bay area it also greatly reduced our domestic sales and since the general strike has been on and we have been unable to ship the equipment into the country it has hurt our rural domestic sales.

Imagine now that in total it will reduce our anticipated volume for July by at least 50 per cent. A rough estimate of our June loss would be 15 per cent.

Even after the strike in the Bay area is settled we will no doubt have continual agitation in the fruit areas which will retard sales until after the crops are all in.

L. H. BENNETT,
President.

Sales Slow Since May

Pacific Radio Trade Association
San Francisco, Calif.
July 19, 1934.

Editor:

The "General Strike" here in the San Francisco-Bay Area has affected the refrigerator business about the same as it has all other businesses.

When the draymen went out on a strike Thursday, the twelfth, practically all deliveries came to a standstill. Then Monday a "General Strike" was called in San Francisco and in the East Bay cities on Tuesday. This strike closed most all stores with the exception of the large downtown stores.

Today, Thursday the nineteenth, the strike is about all broken and trucks are moving on the streets, and no doubt deliveries can soon be made. We certainly have had a tough time, and it was quite evident it was all due to a Red movement.

Sales of refrigerators have been slow since the middle of May. Perhaps it was due to the longshoremen's strike that started in the first part of May. And then again we have had a very mild summer this year; lots of cool weather in particular around the Bay.

Some of the wholesalers and dealers report good business while others are doing very little.

Every citizen, not connected with the strike, is very outspoken against the action of the unions supporting the radical element and now many union men realize their mistake.

Business men have been very optimistic during all the trouble, and now that it is about all over, they are looking forward to a big boom.

Crops are good, prices are up and we are now having a big influx of travelers. Now that the unions have got it off their chests, we are bound to have good times.

GEORGE H. CURTISS,
Secretary.

Closed Up & Left Town

Wharton Refrigeration Service
San Francisco, Calif.
July 19, 1934.

Editor:

Naturally sales fell off and as we could make no deliveries, due to teamsters' strike we were in an awful hole.

That also affected the gasoline and service stations and due to lack of gasoline we were not able to make the local service calls that we can ordinarily take care of.

Teamsters and all other unions went out in sympathy with the waterfront and maritime unions and, of course when the general strike was called it affected every business in every line even to the restaurants.

Saturday evening we had it decided for us to either stay closed or go out with the rest and as we felt it best to close under the circumstances we went to the country for the past four days and came back this morning to find that we will be able to get at delivery on refrigerators tomorrow.

Barber shops, restaurants, butchers, and other necessities are open but things are awfully slow and tomorrow we look for things to be wide open again.

But there is no use saying that it did not paralyze business of every description because it did.

Thank goodness the end is in sight.

E. K. WHARTON.

Business Stopped

Scott-Buttner Refrigeration Co., Ltd.
1452 Bush Street
San Francisco
July 21, 1934.

Editor:

During all of last week business was slowing down in anticipation of a general walk out. As you know at this time, this walk out took place on Monday, the 16th. Business stopped completely in this city at that time. There was no movement of any kind of products requiring trucks, either light or heavy. Restaurants were all closed and no movement of food supplies was permitted by the unions. Street cars were all stopped, as well as taxicabs.

Refrigeration sales stopped immediately as no one could be found who would be interested in listening to a salesman at that time. Automobile sales companies found this to be true and were all closed down the previous Friday or Saturday. Furthermore, they had no gasoline for demonstrating cars. The surprising thing is that our service business practically stopped. I suppose most people took the same

attitude they would on a holiday and assumed that we would be closed in this condition. On Monday afternoon we decided that business was so poor that it would be useless to continue and closed our doors. We were closed Tuesday and Wednesday, and gradually started to open Thursday, as the strike came to a close.

You have no idea how completely a strike of this kind can paralyze a city of this size. While there was practically no violence, nevertheless business found itself absolutely unable to function. The few stores that were open were doing no business and might just as well have been closed. This is something for the American people to think over as the strike did no appreciable good and has done a great deal of damage, both to local business and union labor. There is no question that the weight of public opinion promptly broke this strike, but it should not be permitted to occur again elsewhere.

W. E. SCOTT.

Collections Slower

General Electric Contracts Corp.
San Francisco, Calif.
July 19, 1934.

Editor:

I am told that orders are being closed for future delivery. No deliveries have been possible since last Monday but it is expected that deliveries will be possible tomorrow or by Monday at the latest.

Collections have slowed up particularly in the case of people directly affected by the strike. Most of the people are resuming work today or will be on the job soon and we are confident that collections will soon be normal again.

The newspapers last night announced that all parties involved would submit to arbitration. Because of the short duration of this strike there should not be any serious results.

J. C. SAUR,
Manager.

Effect in San Diego

Bureau of Radio and Electrical Appliances
San Diego, Calif.
July 19, 1934.

Editor:

Even though San Francisco is about as far removed from San Diego as New York City is from Detroit, we do know something of the strike situation down here. Not only are we aware in a general way of the business loss which has taken place up there, but we too have suffered some embarrassment because of it.

As you know, all Pacific Coast harbors have been affected to some extent by the longshoremen's strike which got under way early in May. San Diego and Los Angeles have been taking care of business as usual, with very little difficulty or interference from strikers, as these two communities are not strong union centers; but San Francisco, a union stronghold, has had considerable difficulty in moving freight of any kind, even before the general strike became effective. Since then, business of all nature has pretty nearly come to a halt in San Francisco. During the last few hours the strike's hold has been weakened with present indications pointing to a peaceful settlement within the next day or two. At least so we hope.

In the meantime the electric refrigeration industry in common with all others represented in the Bay region has taken what practically amounts to a holiday, and we in Southern California have been a bit embarrassed in spots. From what we can learn through organizations having connections in both sections of the state, sales in the San Francisco region have been quite slow for some time, and for the past week, or since the general strike was decided on, sales have been practically non-existent. Installation and service, particularly the latter, have not been hampered previous to the general tie-up. In fact we are told that most of the service men work independent of the Unions, and as far as we can learn, necessary service work has been taken care of in San Francisco, even during the last three or four days.

Our slight embarrassment in Southern California in general and San Diego in particular comes, not from local strike conditions, but because in some instances shipments have been routed or re-routed through San Francisco and delay has been caused. One of our large organizations with a principal office in San Francisco reports inability to get refrigerators or other appliances because they came through that point. Others with no connections there have noticed little or no change in business since the original strike difficulty of two months ago. In general, San Diego sales have been well up so far in July. From present indications total refrigeration sales will be half again as great as the June total.

J. CLARK CHAMBERLAIN.

Editorial Features of Coming Issues

August 8 TVA Report

Report on progress made in selling TVA appliances in the Tennessee Valley, with latest news of the situation as regards dealers and distributors. A review of the program from the standpoint of the planners and executors; interviews presenting their aims and purposes.

August 15 Commercial Installations

To contain detailed "how-it-was-done" information on, and pictures of, recent installations of refrigeration equipment in food marketing and food serving establishments.

August 22 Service Manual

Authoritative, practical articles and charts on how to service faulty seals, expansion valves, controls, and motors. Detailed instructions for servicing an "orphan" refrigerator. A treatise on how cabinets and finishes are repaired.

August 29 Air Conditioning

Detailed reports of how particular installations have been made, accompanied by pictures and diagrams, and emphasizing features which individualize each job. Stories about practical experience with actual installations.

September 5 Orphan Machines

Revised list of orphan electric refrigerators with all available information regarding each manufacturer which is no longer in the business of making electric refrigerators, together with information on the disposition of its patents, patterns, stock of parts, etc.

September 12 Commercial Specifications

Complete specifications on all compressors for commercial refrigeration applications including new machines brought out since the publication of last set of commercial machine specifications in March 14 issue of ELECTRIC REFRIGERATION NEWS.

September 19 Inside the Refrigerator

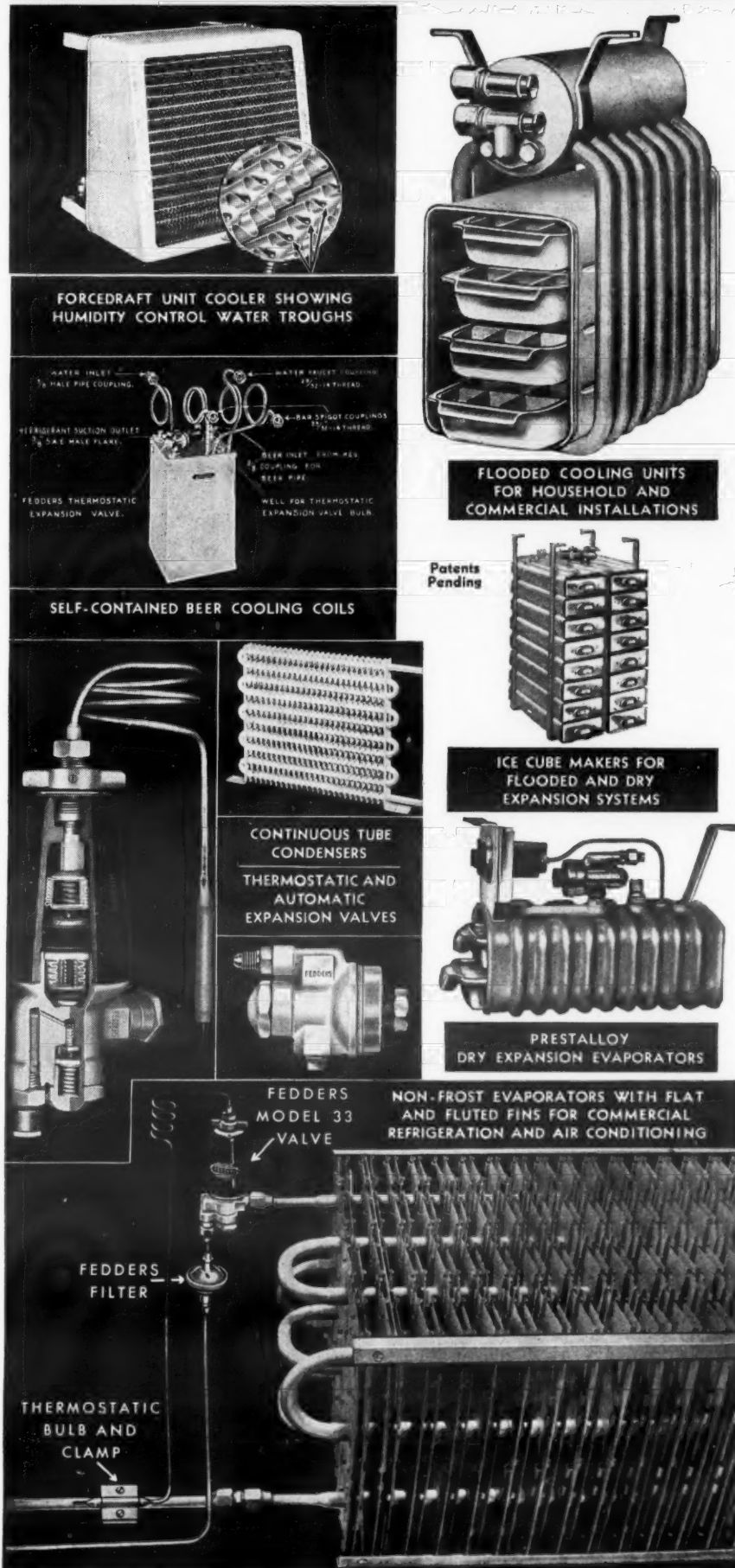
A pictorial display showing the inside of the leading designs of refrigerator cabinets now on the market, with captions emphasizing differences in arrangements and fittings. An article will discuss the history of the art of designing the interior of refrigerator cabinets, showing how year after year manufacturers have been making refrigerators more convenient and more useful to the housewife.

September 26 Air Conditioning

More how-to-do it factual stories about actual installations. Results of tests. New humidifying equipment for winter use.

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WHEN YOU BUY FEDDERS YOU BUY THE BEST

AIR CONDITIONING

5 Baltimore Theaters Cooled by New Frick-Freon Machines

BALTIMORE, Md.—Paul J. Vincent Co. here has recently finished installations of new Frick-Freon enclosed-type refrigerating compressors in five motion picture houses operated by the Frank Durkee Enterprises.

The installations all have the same fundamental design, and all are guaranteed to maintain dry bulb temperatures of 80° F. with a maximum of 50 per cent relative humidity, when outside conditions average 95° F. dry bulb and 78° F. wet bulb.

Each plant is arranged with a control box in the projection room, making it possible for the operator of the projection machine to handle the air-conditioning system.

Control boxes have separate switches for the fan and the two compressors, also for the damper controls on the fresh and recirculated air. Red signal lights indicate when the compressor and fan motors are running.

Instruments enable the manager of the theater to determine when refrigeration is required, and he has merely to telephone the projection room to have the system started.

In each installation there are two compressors with separate condensers and separate connections to the finned cooling coils, permitting operation at half or full load continuously. Thermostatic controls serve to cut in one or both compressors as required.

Approximately 75 per cent of the air is recirculated, being drawn out of the auditorium through grilles extending across the entire face of the orchestra pit, in front of and below the stage. The under part of the stage is used as a plenum chamber.

The return air duct opens into the room in which the direct expansion cooling coils, eliminators, heaters and fan are placed. At the opposite end of the room is the fresh air inlet.

Tubes of the Aerofin cooling units stand vertically, the Freon being fed to these copper tubes by float-valve liquid-level control. The cooler is designed for an air velocity of approximately 650 ft. per minute.

There is sufficient refrigeration to cool the quantity of air required to a dew point of approximately 58° F. while the machines are operating at maximum capacity under a suction pressure of 40° F. and a discharge pressure of 110 lbs. gauge.

Air leaving the single fan goes through a large duct hung under the floor of the auditorium and rises to plaques under the ceiling of both the main room and the balcony. The air velocity through the ducts approaches 1,000 ft. per minute but is reduced to about 250 ft. per minute through the plaques, which spread the air in a horizontal direction. The chandeliers are suspended under the air outlets in some of the theaters and serve to conceal them.

Air is washed by the water of condensation which forms on the cooling coils. This water drains off rapidly, and in surprising quantities.

For instance, at 78° F. wet bulb and

95° F. dry bulb, air contains 118 grains of moisture per pound. Upon reducing this to 60° F. wet bulb the air will contain 77 grains. If 20,000 cu. ft. of air is in circulation per minute, and 25 per cent is fresh air, 5,000 cu. ft. or 370 lbs. is being lowered 18° F. The drop in temperature has precipitated 41 grains per pound, or 15.6 gal. per hour.

The amount of air to be handled was figured on the area and volume of the theater and not on the per seat basis, although it works out approximately 5 cu. ft. per person is allowed. The admission of fresh air keeps the entire auditorium under a slight pressure. By starting the plant about an hour before the show, conditions are right when the patrons enter.

Cool Laundry Office With Universal Unit

GRAND RAPIDS, Mich.—Private office of the new American Laundry building here has just been provided with an air-conditioning system by Boot & Co., refrigeration and air-conditioning engineers.

The system includes a 3-ton Universal Cooler methyl chloride condensing unit (model W-3003) installed in the basement, and serving in direct expansion two Sirocco unit coolers enclosed in wood paneling along the west wall of the office.

One of the cooling units, a Sirocco model 45, is equipped with a heating coil capable of heating the office in the winter, while the other cooler, a Sirocco model 30, provides cooling only during the summer.

Approximately 2,900 cu. ft. of space is conditioned in the office, with a control system which maintains the indoor temperature in summer from 12 to 14° F. below the outdoor temperature.

The three tons of refrigeration capacity would ordinarily be more than necessary for an office installation of this size, according to Arthur Boot, but in this installation there is a refrigeration load of practically a ton and a half from windows on the west wall with the sun shining directly on them.

Awnings would have reduced this load materially, but the laundry management did not want to detract from the external appearance of the building.

Quartet of Newspapers Condition Plants

NEWARK — Four modern newspapers have recently purchased air conditioning for their mechanical plants, according to officials of Carrier Engineering Corp. These are the *Christian Science Monitor*, the *Philadelphia Bulletin*, the *Baltimore Sun*, and the *Los Angeles Times*.

Test Conditioner Goes to Work



G-E air conditioning engineers loaned their test model to a patient in a Schenectady hospital who had been seriously burned.

G-E Puts Conditioner on Life Test to Work In Hospital

SCHENECTADY—Heat and humidity made convalescence anything but comfortable for a hospital patient here who had been severely burned, so air-conditioning engineers of the General Electric Co. decided to try one of the new portable room coolers in the man's room.

A survey showed that the only cooler then readily available was a factory model on "life test." Although it lacked the artistic steel cabinet and other "fixings," the engineers decided it would do the work and might as well be undergoing its life test at the hospital where it could bring relief to the patient.

The cooler was wheeled into the hospital room, connected to a lighting circuit and a water faucet—and put into action. It takes moisture from the air, provides circulation, and has a cooling effect of 700 lbs. I.M.E. per 24 hours, adding greatly to the comfort of the patient.

25 Large Installations Made in New York

NEW YORK CITY—There have been at least 25 large air-conditioning installations made in this city so far this year, estimates Paul J. Heuschkel of the New York Edison Co.'s industrial sales bureau, which is concerned with air-conditioning promotion in Manhattan and the Bronx. By large installations he means equipment of sufficient size to condition restaurants, stores, hotel grills, etc.

Installations in offices of professional men—doctors, dentists, lawyers, etc.—have declined this year as compared with last, but there have been several systems placed in brokerage offices. Sales of equipment for residence conditioning have been few.

The Norfolk St. office of New York Edison was recently equipped with air conditioning, according to Mr. Heuschkel, who believes it is the only air-conditioned utility display room in metropolitan New York City. The system uses ducts for air distribution, and has two Carbondale compressors supplying 20 tons of refrigeration.

Patronage of Air-Cooled Restaurants Gains

YORK, Pa.—Installation of air-conditioning equipment in restaurants has resulted in an average 30 per cent increase in patronage of these establishments during the summer months, according to recent surveys compiled by York Ice Machinery Corp., according to W. S. Shipley, president of the company. The results are based on the experience of air-conditioned restaurants in 29 cities throughout the country.

A further fact disclosed by these surveys, Mr. Shipley states, is that customers of these air-conditioned restaurants eat more in summer than they did before the installation of air conditioning, the average check being 55 cents as compared with 45 cents before air conditioning, an increase of 22 per cent.

And it costs but one cent on the average to keep a customer cool and comfortable each time he comes in for breakfast, lunch, dinner, or a late evening meal, the surveys show. This figure is arrived at after allowance for all items of expense involved such as electricity, depreciation, interest on the money invested in the equipment, water, and miscellaneous expenses.

Baker Freon System Cools Omaha Theater

OMAHA—Baker Ice Machine Co. has just installed an air-conditioning system in the Brandeis Theater, a 1,250-seat house built here more than 20 years ago.

The system includes a 70-ton Baker compressor operating with Freon in direct expansion Trane coils. Two sets of coils were installed, one to cool return air from the theater's auditorium, the other to cool fresh air drawn in from the outside.

A total of about 30,000 cu. ft. of air per minute is handled by the fan, of which 25 to 30 per cent is fresh air. No patented system of air circulation is employed, according to Baker engineers, and on test it has been found that temperatures and humidities are controlled automatically without adjustment of the apparatus.

All together 12 outlets are used to distribute the conditioned air. Of these, two are in the ceiling, and the rest are spaced around the theater's walls. Every seat in the house can be directly covered from at least two of the outlets, the installers claim.

The fan is equipped with a variable speed motor, the only attention required by the theater's mechanical staff being to start the fan and compressor in the morning and turn it off at night. The fan operates constantly during show hours, and the compressor runs only as required, being controlled by a room type thermostat in the theater proper.

The installation was placed in operation early this summer.

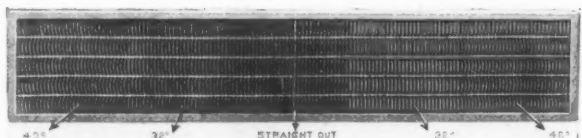
Beauty Parlor Appliances Make Large Units Necessary

HOUSTON, Texas—A General Electric summer air-conditioning system has just been installed in the Nicosia Beauty Parlor at Rusk and Main Sts. here by the Edmundson Refrigerating Corp., G-E air-conditioning dealers in this territory.

The system provides cooling, dehumidification, cleaning, and circulation in about 18,000 cu. ft. of space. Of the central type, the installation includes a 15-hp. G-E Freon condensing unit serving six G-E direct-expansion evaporators installed in a special housing. The compressor is installed in an adjacent room.

An extremely heavy heat load from the electrical appliances used in the beauty parlor, as well as a heavy latent heat load, made it necessary to install refrigeration capacity which would otherwise have been excessive, according to the installers. Lack of space for the large condensing unit and for the air-conditioning housing was also a problem, they report. An indoor temperature of from 80 to 82° F. is maintained.

Air is circulated by a No. 4 Sirocco blower, with a capacity of 3,800 cu. ft. per minute, through grilles connected with small ducts sliced off a main trunk duct. Horizontal grilles were used, being installed in the wall near the ceiling. Duct work on the job was done by the Holtkamp Sheet Metal Works.



High Velocity Five-Way Air Flow Uni-Flo Outlet

Uni-Flo Engineers Will Help You With Air Distribution Problems

Many air conditioning engineers and dealers have found in Uni-Flo engineering service the answer to their "air flow" problems. At first thought the grille problem may seem simple, but many otherwise good installations have failed to give satisfaction because the grilles used did not give the proper air distribution.

Uni-Flo-Directional Air Flow Outlets direct the air to almost any desired position by using combination of different type cores. Air may be controlled to flow right, left, fan shape, or in up or down direction.

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rolling action to the air is created causing an aspirating effect at the face of the outlet that induces room air to mix with the discharged air thus tempering the air at the face of the outlet before its distribution throughout the room. This is a very desirable feature especially when refrigerated air is distributed, as the pre-tempering of the air at the outlet increases the distance of air delivery at lower velocities insuring quiet air discharge.

Write today for the Uni-Flo engineering bulletins giving you the information you need on air distribution.

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Air Conditioning

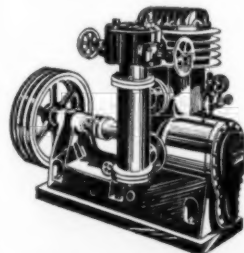
Is used in scores of restaurants, theaters, hotels, stores, homes, etc. Systems for Freon, ammonia, methyl chloride, or carbon dioxide refrigeration.

Certain attractive territories open for distributors. We offer a complete line of air conditioning equipment. Get full information now. Write

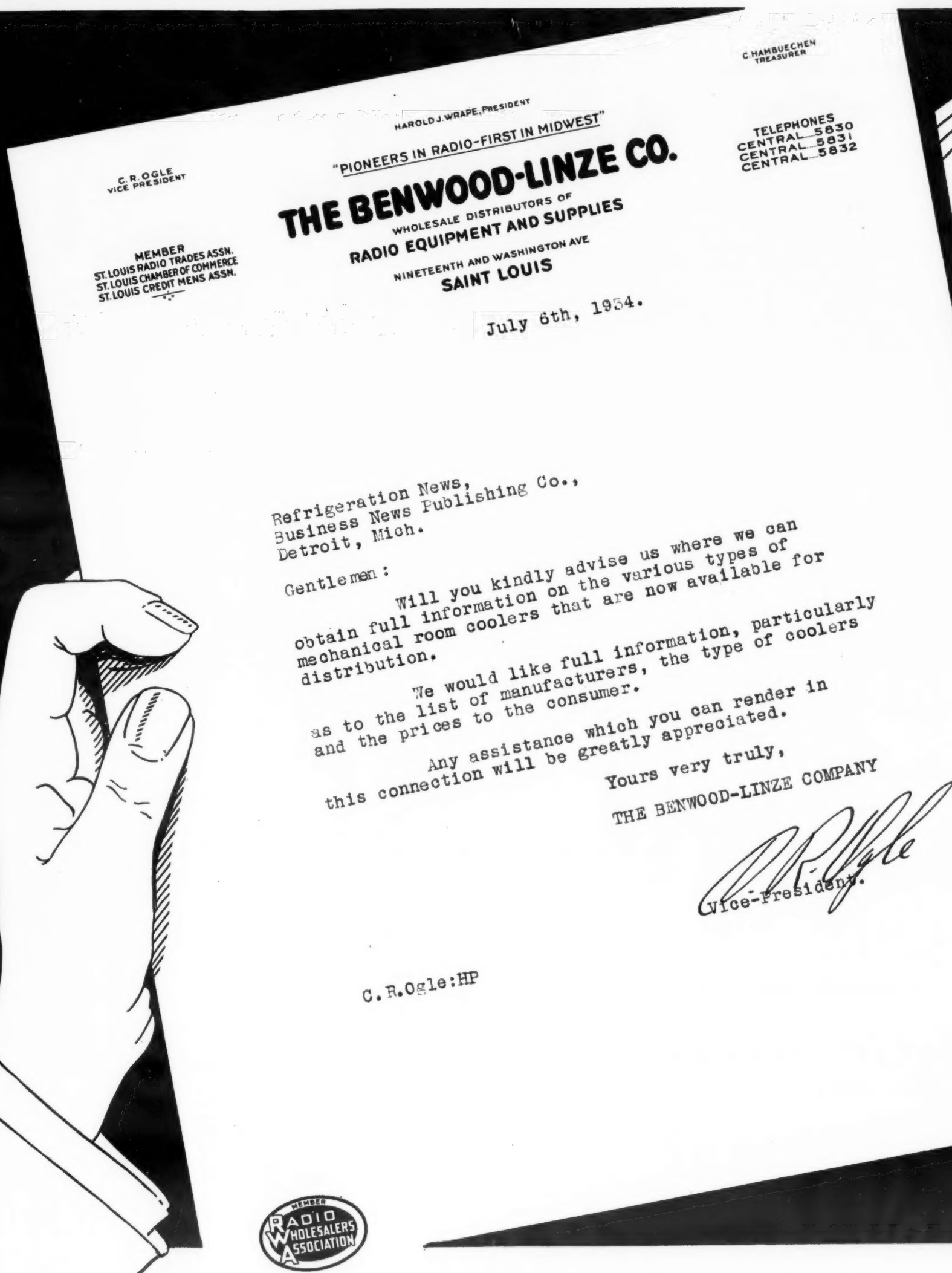
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ICE MACHINERY SUPERIOR SINCE 1887



Low Pressure Unit



Enclosed Type Freon Compressor



They are seeking information - - They are forming opinions - -

THE distributors and dealers who read Electric Refrigeration News account for the large part of household and commercial refrigeration sales. They have built their businesses on the idea that the way to sell is to go out after the business and not wait for it to come to them. Many of them have ideal facilities for selling room coolers and complete air-conditioning equipment. They understand specialty selling. Installation and servicing are an old story

to them, and where air conditioning presents problems with which they are not familiar, experience has taught them to add the needed technical ability to their staffs.

While air-conditioning sales are increasing, distribution for most manufacturers is still spotty. In every locality there are distributors and dealers who are making ready to enter the air-conditioning business. They are seeking information. They are forming opinions. They are reading the *News*.

This situation presents a fine opportunity for the air-conditioning manufacturer to broaden and strengthen his distribution—to become identified as a leader in this new field—by the use of advertising in Electric Refrigeration News. The consistent appearance of such advertising will supply the sales information which these distributors and dealers want.

Explain your products and proposition and their inquiries will come to *you* direct.

ELECTRIC REFRIGERATION NEWS, 5229 Cass Ave., Detroit, Mich.

AIR CONDITIONING

DePuy Discusses Motors for Use In Air-Conditioning Plants

Direct-Connected Synchronous Motor Used for Jobs of More than 30 hp., and Induction for under 30 hp.

By J. A. DePuy*

Engineering Division, York Ice Machinery Corp., York, Pa.

In general, electricity is used in the refrigerating plant for motive power, protection, and control. The major motor load is the compressor. In addition there are pumps and agitators for circulating brine and water, also fans and blowers for supplying air, all of which require motors. The motors must be started and stopped, so a starter of some form is necessary. The starter

more than 30 hp. is the direct-connected synchronous motor. Compressors in this class are driven at speeds of 360 r.p.m. for the 30 hp. and as low as 180 r.p.m. for compressor requiring 800 hp. In general, the greater the horsepower requirements, the lower the speed of the compressor.

Protective devices are necessary. Those for the motor are usually included in the starter panel. Protective devices for the plant as a whole may consist of pressure operated switches in refrigerating lines to stop compressor in the event of excessive pressures, pressure and velocity actuated switches to stop compressor should water supply fail; current and voltage relays which function to prevent damage to equipment.

Electric valves of both the solenoid and motor-operated type are used extensively for controlling the flow of refrigerant, water, brine, and steam. Electric dampers are found in air-conditioning work, with their various means of control, such as thermostats and humidistats.

The selection of the compressor motor and starter is one of the problems in the design of a plant. Let us consider equipment for alternating current supply only, as this is common in the large majority of plants.

Synchronous Motor

This limits the choice to one of two general types—the induction motor and the synchronous motor. When the synchronous motor is used it is almost always direct connected to the compressor shaft. Contrariwise, induction motors are usually belted.

The popular drive for vertical single-acting compressors requiring

The slow speed synchronous motor is the ideal drive for compressors. They are purchased without shaft or bearings, and are mounted directly on the compressor shaft. Such a drive offers the advantage of low first cost in the larger size (125 hp. and above), compactness, high efficiency, and power factor improvement. The latter is a very important feature of installations where a power factor clause appears in the rate schedule.

The compressor is a reciprocating load and requires a pulsating torque. The flywheel effect in the motor rotor iron out the torque pulsation to a point where it is not detrimental. Flywheel effect is very important, as can be readily seen, for if the motor does not have the proper WR², the resulting torque pulsations will react in the power supply as current pulsations which in turn acting on the impedance of the line and transformers will cause voltage fluctuation.

Voltage Fluctuation

Excessive voltage fluctuation is a detriment to any power system as it may cause improper operation of other motors on the line and also lamp flicker. Excessive current variation also is a detriment to the motor, as the reversal of torque tends to shake the stator coils loose, chafing the insulation which is likely to result in motor failure.

Flywheel effect was one of the outstanding problems in applying syn-

chronous motors to compressors. A great deal of work was done on this subject by motor manufacturers in cooperation with compressor builders.

The question was—How much current pulsation is allowable? The National Electrical Manufacturers Association and American Society of Refrigeration Engineers have agreed that in general, the equipment that limits the pulsation to 66 per cent of the normal, or rated input to motor will be satisfactory for the average installation.

Motor manufacturers based their design on this figure and have worked up flywheel requirements for practically all classes of compressors. Today it is only necessary for the compressor builder to inform the motor manufacturer of the bore and stroke, speed, working pressure of the compressor, and whether the compressor will operate under balanced conditions. The motor manufacturer has the necessary information in his files, such as weights of reciprocating parts, and crank effort diagrams, which enables him to supply the proper flywheel effect. Thus the compressor builder is relieved of all burden in this respect.

Usually no flywheel is needed other than that in the motor rotor, which is of a large diameter, necessary to permit the assembly of a large number of poles to obtain the slow speed. This adds to the inherent WR² which in most cases, is desirable.

Where the motor does not have sufficient WR² of itself, ballast rings are attached to the rotor. These are cast iron rims of approximately the same diameter as the motor.

Starter Simplified

The starter for the synchronous motor has been simplified in the last few years so that all that is necessary to start is the closure of a pilot circuit by means of a push button, thermostat, or some other control device, and the motor starts and synchronizes without further attention. This has been an important factor in the almost universal adoption of the engine type synchronous motor for driving the larger reciprocating compressors.

The synchronous motor has many advantages also, some inherent disadvantages; namely, low starting and pull-in torque and the fact that it is a constant speed machine.

The starting torque which is practical to build in a slow speed synchronous motor is limited to approximately 40 per cent of full load torque. Higher torques can be had but the size and cost of motors is increased.

A compressor which starts under load (that is, starts pumping gas and doing useful work the instant the motor starts turning) requires a starting torque considerably above the full load running torque, which is not practical in the engine-type synchronous-type motor for refrigerating work. It is necessary therefore, to provide some means of unloading the compressor at the start and keeping it unloaded until it has accelerated to full speed. This is done by means of a full bypass.

Relieving High Pressure

In air-compressor work it is possible to unload the compressor by opening a valve on the discharge side of the cylinder and discharging the air to the atmosphere during starting and accelerating of the compressor.

With refrigerant compressors the problem is more difficult because of the necessity of keeping the refrigerant entirely within the system. This is accomplished by arranging a valved connection between the discharge and suction of the cylinder.

When bypass is opened the gas is bypassed from the discharge side to the suction side and no appreciable torque is required of the motor other than to overcome the friction load of the machine. This usually amounts to a relatively small proportion of the full-load torque. Thus the synchronous motor with its 40 per cent starting torque and 40 per cent pull-in torque is suitable for starting and accelerating compressors of the vertical single-acting type when started unloaded.

Bypass Valves

The bypass valve mentioned above may be a hand-operated valve in the manually operated plant, in which case the operator opens the valve before starting the motor and closes the valve after the motor has pulled into step.

If the plant is full automatic, the bypass valve will be automatic in operation, that is, it will open the moment the synchronous motor starter control circuit is energized and close as soon as the motor is pulled into step.

In case the motor pulls out of step, due to a momentary overload or voltage dip, the unloader valve will open and allow the motor to operate on a squirrel cage winding without load, and pull back into step when the cause of the disturbance is removed.

The automatic unloader has an important place in every plant, whether hand or automatic—particularly in those localities where momentary voltage disturbances are frequent, due to electrical storms.

The fact that synchronous motors are constant speed machines is a disadvantage in refrigeration, and has been mentioned. This is because

reduction of the speed of the compressor is a convenient means of partially reducing the capacity.

In refrigeration, the engineer attempts to maintain the highest evaporator or suction pressure that is possible and still maintain the proper temperature at the evaporator. This is because the horsepower per ton of refrigeration increases as the suction pressure decreases.

Many types of refrigeration loads fluctuate daily. For example, air conditioning, where the load depends largely on the weather. As the load decreases it is necessary to reduce the capacity of the machine in order to maintain a high suction pressure.

In the days of the steam drive, this could be done very simply by regulating the speed of the steam engine. This is not practical with the synchronous motor drive, therefore other methods must be used.

The most economical solution for vertical single-acting machines is the partial bypass. Valves are placed in the cylinder walls in such a position that only a part of the stroke will be effective. When the valve is opened the gas for the first part of the stroke passes through the port into a conduit which leads to the suction of the compressor. When the piston covers up the port on the up-stroke the remainder of the gas in the cylinder is compressed in the usual manner. The net result is that the stroke of the compressor is reduced, hence the capacity.

This valve may be manually operated in the manual plant and automatically operated in the automatic plant. When automatic, this valve is usually actuated by a thermostat or pressure switch.

Induction Motor & Starter

For compressors below 30 hp. some form of the induction motor is used. The induction motor, unlike the synchronous motor, can be built economically with a starting torque as high as 300 per cent of full load, therefore is very satisfactory for starting compressors under load.

No starting bypass is required and it costs very little more to arrange the compressor for automatic operation than it does for manual operation. Several factors which must be considered in the use of induction motors are:

1. Starting current.
2. Radio interference.
3. Lamp flicker.
4. Quietness of operation.

The power companies limit the starting current of motors in order to prevent serious voltage fluctuations. The double squirrel-cage motor with its high starting torque and comparatively low starting current will usually meet the starting current regulations up to 30 hp. without the use of a reduced voltage starter.

When applying induction motors of the larger sizes, the compressor manufacturer consults with the power company to determine whether the motor in question will be satisfactory from the point of view of starting.

Radio interference is a consideration on single-phase motors. Motor manufacturers have this trouble well in hand, and it is no trouble to select motors with no appreciable interference.

Lamp flicker may be a source of

trouble on 110/220 volt combination power and light systems. This is caused by variation in current and power factor of the motor during the compression and intake stroke of compressors. These variations act on the impedance of the line to cause voltage fluctuations. When trouble occurs it is usually on a system which is well loaded.

The compressor manufacturer can alleviate lamp flicker to some extent by using large flywheels and designing compressors to operate at fairly high speeds, i.e., 300 to 500 r.p.m. However, there is a limit to this, which power companies fully appreciate, and are increasing the size of their distribution system to accommodate this very desirable refrigeration load.

Quiet Motors Needed

Quiet operating motors are very important in air-conditioning work, particularly in residential installations where the equipment is installed in the basement or in the room with the occupants.

The company with which the writer is connected makes a thorough test of motors which are applied in this manner to determine whether they operate quietly. Such tests are made with sound meter which measures the noise in decibels. The human ear is not relied upon for this work.

Electrical manufacturers are doing much to accomplish quiet operation both in the inherent designing of the motors and in the design of flexible mountings.

The importance of quietness in motors cannot be exaggerated. It is just as important as temperature rise or any other characteristics of the motor and we believe it is entirely possible that in the future the noise rating will appear on the nameplate along with the other information.

Protective Devices

Let us consider some of the protective features in the refrigeration plant. The use of electricity makes it possible to use some very simple, inexpensive devices for this purpose. Some items costing not more than \$20, protect thousands of dollars worth of equipment.

The most common plant protective device is a pressure cut-out actuated by the pressure of the water delivered to the condenser. Another pressure cut-out is actuated by the pressure of the refrigerant in the condenser.

Function of these two devices is to protect the system against excessively high refrigerant pressures. Perhaps the most common cause of high refrigerant pressure is lack of water. This seldom occurs on city systems, however it is not unusual where pumps supply water from wells or cooling towers. In case of water failure the water pressure cut-out will function to shut down the compressor.

If high refrigerant pressure is due to some agency other than lack of water, then the refrigerant cut-out will operate to stop the compressor.

It is often necessary to protect some pieces of equipment against freeze-ups during the normal plant operation. For example, closed water coolers, where the freezing of the water might burst the cooler. Protection is accomplished by placing a

(Concluded on Page 15, Column 1)

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There is a supply of **Artic*** for service
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*"ARTIC" is Du Pont Methyl Chloride, especially manufactured for refrigeration purposes. Manufactured by

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AIR-CONDITIONING FITTINGS



Commonwealth Brass fittings for air-conditioning installations may be had, from standard stocks, in every wanted size.

There is a community of interest between refrigeration and air conditioning so that many refrigeration fittings may be immediately incorporated in air-conditioning installations.

Other fittings, common to the oil-burner industry, are called for in the new art and Commonwealth is the logical source of supply for both types.

New style fittings, including those of special design, are made to order promptly on receipt of sample, blueprint or sketch.

Bear in mind that Commonwealth Fittings "Built Right to Stay Tight" are made by specialists, in a modern plant, majoring for the past 25 years, on fittings of every type.

When in need of fittings, think "Commonwealth."

COMMONWEALTH BRASS CORPORATION

Commonwealth at G. T. R.R. Detroit, Mich.

Controls Used for Humidity, Pressure and Temperature

(Concluded from Page 14, Column 5)

thermostat bulb in the water of the cooler and another in the refrigerant. These thermostats are set for the minimum allowable temperature and function on a drop in temperature to stop the compressor.

A further precaution is the use of current relay connected in series with one line to the motor which drives the cold-water pump. This relay is set to maintain a contact when the current input to the motor is normal which indicates a full flow of water through the cooler. If a freeze-up starts in the cooler or if the pump loses its suction, the current to the motor would decrease in value which will act on the relay to break the contact in series with the pilot circuit of the compressor motor starter and stop the compressor.

When all these protective features are included in a plant, the following conditions must be fulfilled before the compressors can operate (exclusive of motor overload protection):

1. The condenser water pressure must be above a safe minimum.
2. The refrigerant pressure must be below a safe minimum.
3. The temperature of the water leaving the cooler and temperature of the refrigerant must be above a safe minimum.
4. There must be a full flow of water through the cooler.

Control

Electricity has made many inexpensive control devices available which have been a valuable asset to mechanical refrigeration. The use of controls (we refer to temperature, humidity, and pressure-operated devices) eliminates the need for personal attention and makes the maintenance of constant temperature or pressure possible. The value of mechanical refrigeration is often enhanced by the use of automatic controls, when without them it would not be a desirable investment.

A refrigerating system is operated to maintain a temperature between certain limits. When the low limit is reached the refrigeration should be stopped—to continue refrigeration longer would be a waste and in some instances might result in a loss of product, due to too low a temperature.

Hand-Operated Plant

When the temperature reaches the high limit, refrigeration should be started, otherwise there might be another loss due to temperature being too high. In the manually controlled plant refrigeration is started and stopped by the operator. If the load is variable, the operator must watch the temperature very closely, so that he can start or stop refrigeration when the critical temperatures are reached; if close temperature limits are to be maintained he will have little time for anything else.

Electrical switches (thermostats) are available which act in response to temperature changes to open and

close a circuit. This instrument will watch the temperature closely and act to start and stop refrigeration in accordance with the demands, at any temperature for which it is adjusted. Thus, the personal element is removed from temperature control.

There are numerous ways in which the thermostat may be used to control temperature. It may start and stop a compressor where only one evaporator is employed. On installations consisting of several rooms, on one compressor, each room is being maintained at a different temperature, the thermostat may control solenoid or motor-operated valves in addition to controlling the compressor.

Each room has a thermostat set for the temperature required in the room, which operates one or more valves. When the room reaches the required low limit the thermostat closes the valve or valves and cuts this room off from the compressor so that the operation of the compressor no longer has any effect on this particular room. When all of the rooms have reached the low limit, which means the compressor is no longer required, the compressor stops.

Controls Dampers

In air-conditioning work, the thermostat may control dampers to maintain the proper temperature of air.

Thermostats are used in some classes of installation such as testing laboratories and process work, to control temperatures within $\frac{1}{4}$ ° F. of a set point, plus or minus. However, plus or minus 2 or 3° F. is usually sufficiently accurate.

A significant point is that although a thermostat will act within very close limits, this does not necessarily mean that the temperature of the refrigerated space or material will be maintained within the limits of the thermostat.

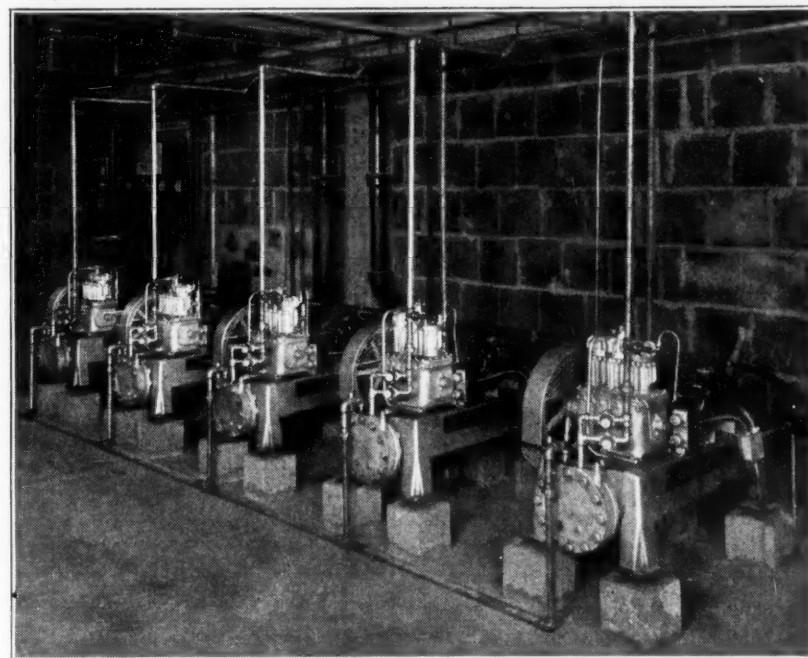
This is because the "flywheel" effect of the load on the evaporator may be too much or too little and cause a greater variation in temperature than the setting of the thermostat. For instance, if the load is heavy and the evaporator a little small the temperature slip will be above the high setting of the thermostat and if the load is light and the evaporator a little large the temperature slip will be below the low setting of the thermostat.

Another temperature control device is one which automatically changes its setting at a predetermined time of the day. This is valuable in certain process work. For example, at 9 a. m. a temperature of 50° F. is required. It is further required that this temperature be gradually reduced to 20° F. by 3:00 p. m. and repeat this cycle. This can be accomplished without personal attention.

Humidistat Used Extensively

The humidistat is an instrument used extensively in air conditioning. It acts in response to changes in percentages of relative humidity to open and close an electric circuit. In the winter time it is used in connection with humidifying equipment to open or close a solenoid valve in a water supply spray which adds moisture to the air to maintain the proper level of humidity. In the summer time the humidistat may be connected to control dehumidifying equipment to remove moisture from the air.

Making Dinner Patrons Comfortable



Five 3-ton Carrier compressors, operated by a thermostatic control, from the dining room, supply cool comfort in Clark's restaurant, Cleveland.

There is also an instrument which combines the action of the humidistat and thermostat to maintain a comfortable temperature. It is generally known that both humidity and temperature are responsible for the human sensation of heat or cold. It is not temperature alone, nor humidity alone, but a combination of the two which results in a given sensation. This condition of body sensitivity has been analyzed by several research groups, and a new measure of human comfort has been evolved, which is termed "effective temperature." The instrument which combines the action of the humidistat and thermostat may be called an effective temperature control, and electricity is responsible for its development to its present stage.

The photoelectric cell or "electric eye" is familiar to you, and has some places in the industry. It has been exploited to some extent in air conditioning to start ventilating fans when the smoke in a meeting hall becomes a certain density. Another use for it is to stop humidifiers in a room when the window panes begin to fog. Still another application is the control of liquid level where the accuracy is

greater than the conventional float switch.

The use of the Peltier effect for lowering temperature may find an application in the refrigeration field. The Peltier effect is a more or less well known phenomenon which manifests itself by a lowering of temperature when a direct current flows from one particular metal to another. It has not yet reached a practical stage, but further research and development may do so.

Modine 'Ice Fan' Used in Small Offices & Shops

RACINE, Wis.—Modine Mfg. Co. of this city is marketing its "Ice Fan" room cooler again this summer for use in cooling small offices and shops. This cooler has an electric blower which forces air across a charge of water ice and into the room.

It is built in sectional steel cabinets which may be operated in combination to cool spaces larger than would be possible with just one cooler. Three models are offered, with ice capacity of 75, 150, and 225 lbs. each.

Clothing Store Has Neat Installation

DETROIT—After several years of retirement from business, the firm of Hickey's, men's clothiers, has opened a new store on Washington Blvd. here, and has equipped it with Westinghouse comfort cooling, according to H. B. White, sales manager of Mechanical Heat and Cold, Inc., Westinghouse air-conditioning distributor in Detroit.

Cooling is supplied by a 12-ton Westinghouse (RW-12) compressor. The installation was so arranged that at a later date capacity may be increased to supply comfort cooling for the Pack-Wolin women's-wear shop, which rents store space from Hickey's in the same building.

Trane coils are used, and air is introduced in the store through ducts which were built in and concealed during the store's remodeling. No grilles are visible. Those at the supply outlets are concealed by tall garment-display cases, or are "blended in" with decorative grille-work. Return-duct grilles are concealed beneath showcases. The system recirculates 75 per cent of the inside air.

Located in the basement, the compressor—which has six cylinders and is of the direct-driven automotive type—stands on a base which is attached to a sub-base by four coil springs to give "floating power," according to Mr. White.

50,000 Sq. Ft. Cooled In Department Store

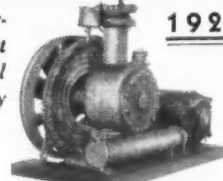
HARTFORD, Conn.—The basement, first floor, and first floor mezzanine, with a total working area of more than 50,000 sq. ft. in the Fox department store were air conditioned this summer by Carrier Engineering Corp.

The equipment installed is adequate in capacity to extend air conditioning service to a fourth floor beauty parlor when desired.

The system will handle in excess of 60,000 cu. ft. of air per minute. The installation is of special interest to its installers in that the refrigerating machine was placed under a warehouse across the street from the store.

Cooled water from the Carrier centrifugal refrigerating machine comes through a tunnel to the dehumidifier which is installed in the sub-basement of the store. Between 200 and 250 tons of refrigeration capacity per day is installed.

The First Curtis Unit Built in 1922 Still Operates Today



1922

1923

1924

1925

1926

1927

1928

1929

1930

1931

1932

1933

1934

80 Years of Manufacturing Experience

40 Years of Compressor Building

12 Years' Experience in Producing Refrigerating Units

Curtis is one of the oldest and most experienced refrigeration equipment makers. And the Curtis line is one of the most complete lines available.

Watch! for an interesting Curtis announcement to be made shortly in this publication.

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Refrigerating Machine Co.

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1912 Kienlen Ave., St. Louis, U.S.A.
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COMFORT

When Winds Blow Hot
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AIR CONDITIONING

Continuous operating dependability is the greatest factor in assuring popular demand for air conditioning equipment... Cool comfort in Summer... Warm comfort in Winter... Healthful surroundings throughout the year.

Much depends on the motor. And, much has been contributed by Century. Beginning with the development and pioneering stages, Century has always played a necessary part in bringing Air Conditioning Equipment to its present stage of acceptance, through dependability and cost of operation.

We invite requests for engineering co-operation... whether your application calls for Single Phase, Polyphase, Direct Current, Multispeed, Open, Enclosed, Totally Enclosed Fan Cooled or Explosion Proof Motors. Up to 600 Horse Power.

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SERVICE

How to Test Operation of Larger Absopure Commercial Units

Information also Given on Maintenance of Condensers, Expansion Valves, Receivers, and Belts

SERVICE instructions on the larger series of Absopure commercial condensing units are presented in this issue of the NEWS. Last week series "E" and "F" compressors were studied from the service angle; this week, series "H," "I," and "J" are treated, with additional service information on air and water-cooled condensers, belts, receivers, and expansion valves.

As shown in Fig. 1 adjoining, the compressors used in series "H," "I," and "J" machines are of the reciprocating type, with two cylinders both in a common cylinder block. These compressors are run at different speeds to produce different refrigeration capacities. The cylinder head is in one piece, and bolts on to the cylinder block. There is one line valve on the cylinder head.

To test the compressor, isolate the compressor from the rest of the refrigerating system by closing the suction line valve on the side of the compressor and the top line valve on the cylinder head, and pumping air. The line valves should be closed tightly by turning the stems in as far as possible.

To test the compressor, remove the plugs from the ports in the line valves and let the compressor run for a few revolutions. Screw a pressure gauge into the port on the top line valve.

Keeping your hand on the switch, let the compressor run and watch the gauge. The pressure should go up without hesitation until it reaches 200 lbs. When it reaches 200 lbs., stop the compressor and watch the gauge. A slow drop in pressure does no harm. If the gauge needle drops

of the system after it is compressed in the cylinders, and close tightly enough that the vapor cannot return to the cylinder. These valves work automatically, and are opened and closed by pressure only.

Each discharge valve has a round serrated steel disc which is held against the valve seat with a light spring. The lift of the valve is limited in normal operation. Two stiff flat springs on the top of the discharge valve allow an excessive lift, if, at any time, the valves are called upon to pass either liquid methyl chloride or oil.

Testing Discharge Valves

The discharge valves can best be tested for leaks before the valve plate is removed from the compressor. This procedure is described at start of article.

If the discharge valves fail to hold properly, examine the seats and the valve discs. A small piece of foreign matter may be holding a disc off the seat. Either the disc or the valve seat may be scratched or scored. The valve disc must be flat, smooth, and clean. If it shows any indication of damage the disc should be replaced.

Discharge Valve Assembly

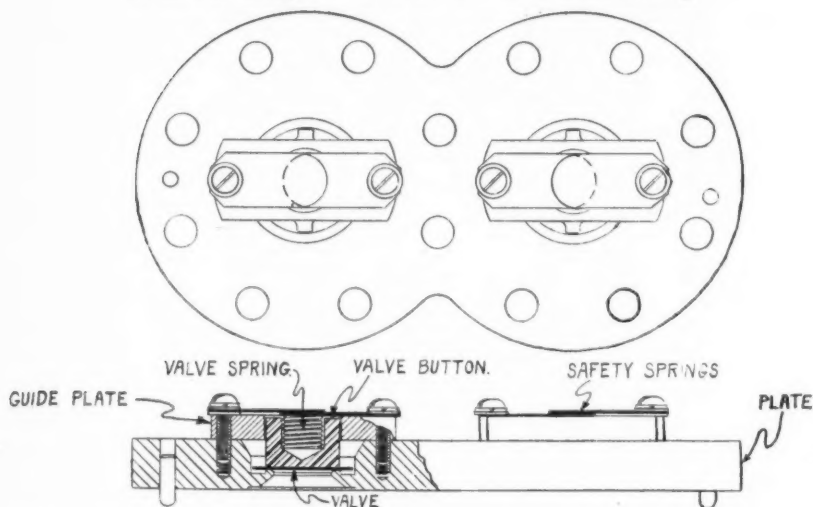


Fig. 2. Discharge valve assembly used in larger commercial compressors.

rapidly, it indicates a leaking discharge valve.

If the compressor pumps slowly, it indicates a faulty suction valve, or possibly piston rings that are not seating properly. Piston rings seldom cause trouble. A suction valve is probably at fault.

After locating the failing part, it can be repaired or replaced as described in the instructions given in this article for that particular part.

Discharge Valve

The discharge valves act as one dividing line between the high pressure side and the low pressure side of the system. They admit methyl chloride vapor to the high pressure side

Repairing Discharge Valves

If the valve was held open by a foreign matter, or appears at all dirty, wash all the parts thoroughly with gasoline or carbon tetrachloride. After washing a part with carbon tetrachloride, always dip the part in oil to prevent rust.

An examination of the valve seats and discs will quickly show which valve and which part is at fault. This valve assembly is shown in Fig. 2.

Intake Valve

There is an intake valve on the top of each piston. This is illustrated in Fig. 3. Note that the intake valve has a double seat, and the valve disc is

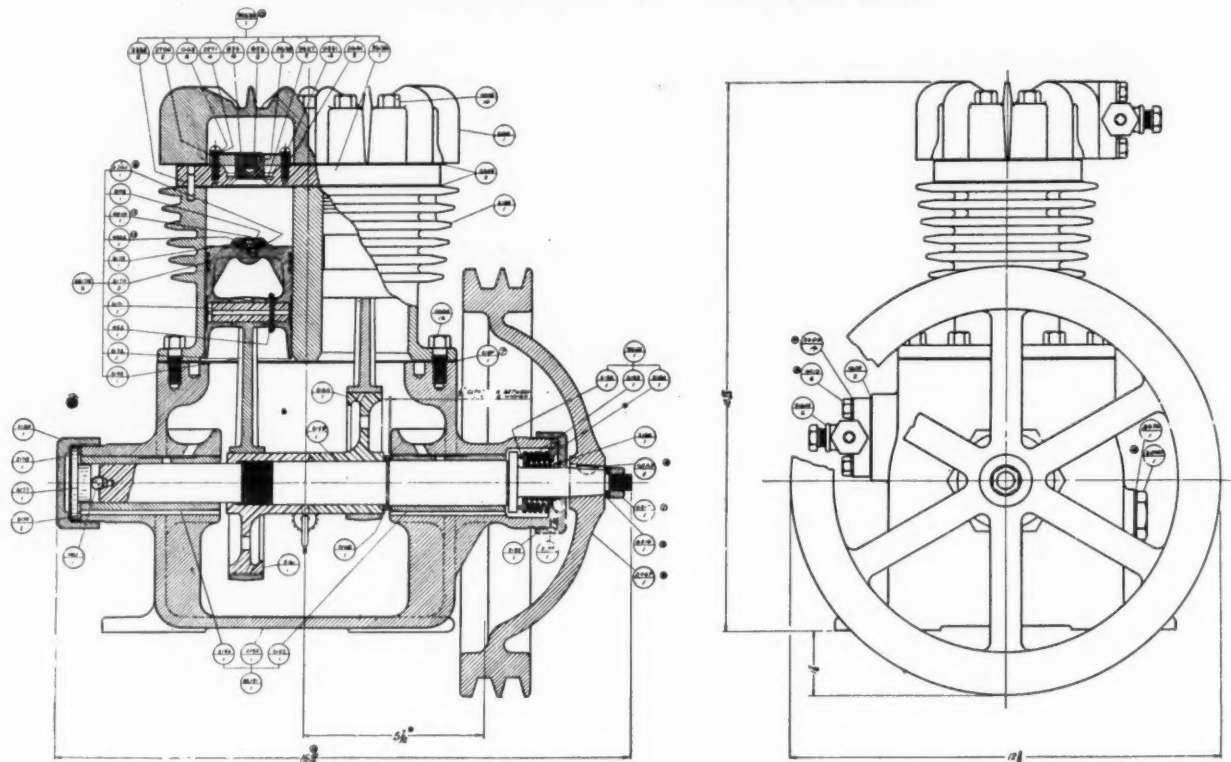


Fig. 1. Cut-away section (left) and end view (right) of series "H," "I," and "J" Absopure commercial compressors. Field service operations for these machines are described herewith.

a circular steel disc with a hole in the center. Holes through the top of the piston between the two seats admit methyl chloride vapor to the cylinder from the crankcase.

The suction valve admits vapor from the crankcase on the down stroke of the piston, and closes automatically so that the vapor is compressed in the cylinder and forced through the discharge valve.

Testing the Intake Valve

The intake valve can be tested most satisfactorily before the compressor is taken apart. The indications of a failing suction valve were given above under the heading "Testing the Compressor."

A small piece of foreign matter can hold the intake valve open and stop that cylinder from pumping. If a compressor fails to pump properly, remove the valve retainers and the discs from the top of the pistons and carefully examine the seats and the discs. Both the discs and the seats should be bright, clean, and free from scratches or marks of any kind.

Repairing Intake Valves

An examination of the intake valve will quickly show you what part is at fault. A black spot on a valve disc directly above the valve seat indicates that that part of the intake valve is not seating properly.

A valve disc may be bent due to high pressure at some time. The service man should always have extra intake valve discs in his tool kit so that new ones can be installed at any time it is found necessary.

The valve disc is held in place by a steel retainer with a screw in the center of it. Be sure, when re-installing the valve retainer, that the dowel pin between the valve retainer and the piston is in place, and that the lock washer is under the head of the screw. This is important, as a loose valve retainer may damage the compressor.

If the top of the piston is not clean, wipe it carefully with a cloth dipped in gasoline or carbon tetrachloride. Be careful that no gasoline or carbon tetrachloride gets into the crankcase and dilutes the oil.

Piston Assemblies

There are, of course, two piston assemblies in this compressor. The two are the same, except for the cam. A piston assembly consists of a piston, two piston rings, a suction valve disc and disc retainer, a wrist pin and cotter key, a connecting rod, and a cam.

Fig. 1 illustrates this compressor. Examine the cams on this drawing, and note that one is threaded and one is not, and that the cams are so notched that when they are in place on the shaft, they are in effect one part.

These assemblies convert the revolving movement of the camshaft to the reciprocating movement that compresses the vapor in the cylinders. The pistons must move smoothly in the cylinders, and the rings seat against the cylinders on their entire circumference.

The wrist pins should allow the pistons to move freely and smoothly on the connecting rods, but must not be at all loose. The connecting rods must be perfectly straight so that the pistons are at exactly right angles to the shaft.

Testing Piston Assemblies

There are two important tests for the piston assembly. The first is an examination of the cam and connecting rod bearing to be sure that this bearing does not bind at any point,

and is free from scores. If there are any scores in either part, the entire assembly should be replaced. Very small marks can usually be removed by polishing that part with a very fine file or emery cloth.

After polishing a part, be very careful to wash it thoroughly. Any emery left in a bearing will soon ruin both parts.

The alignment of the connecting rods can be checked by examining the pistons. If the connecting rod is straight and true, there will be a slight indication of wear or a high polish on the piston on the lower skirt of the piston on one side, and at the top of the piston on the other.

These polished places are directly in line with the swing of the connecting rod. If they are at any other point, it indicates that the rod is not straight, and the entire assembly should be repaired.

Intake Valve

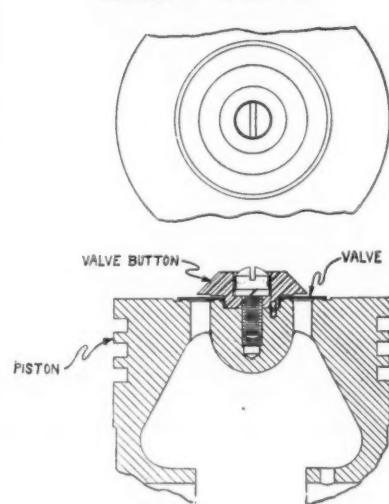


Fig. 3. Absopure intake valve, note the double seat of the steel valve disc.

Examine the piston and cylinder for scratches and scores. If the marks are very small, polish them with emery or a fine file and thoroughly wash the parts. Any and all parts that are badly scored should be replaced.

Repairing Piston Assemblies

To remove the piston assemblies, first take the compressor off of the condensing unit and put it on the work bench. Remove the cylinder head, discharge valve, and the cylinder block.

Insert a wood block in the crankcase so that the cams cannot turn. Facing the flywheel end of the compressor, turn the flywheel counter-clockwise. Be sure that the wood block is in such a position that there is no strain on the arm of the connecting rod.

Only the lower part of the rear connecting rod should touch the block,

otherwise the connecting rod might be bent while it is being loosened.

The rear cam is threaded on to the camshaft with a right hand thread. The two cams are morticed together halfway between them. It may be necessary to put considerable force on turning the flywheel to loosen the cam.

As soon as the cam is started, the shaft will turn freely. Before turning the flywheel over three or four revolutions, loosen the seal nut with a wrench. Unscrew the camshaft from the cams and the seal nut alternately or together, and the shaft, flywheel and seal can be removed together.

After the shaft is removed, the piston assemblies can be lifted out of the crankcase. When you remove the piston assembly, you will find the thrust washer in the bottom of the crankcase. It is a hardened steel washer that goes between the cam and the small shoulder on the shaft at the back of the front main bearing.

There is a single ball thrust in the back of the rear main bearing. If the ball fell out of this bearing when the shaft was removed, replace it before reassembling.

To reassemble, start the shaft through the front main bearing so that it projects about one-quarter of an inch. Hang the thrust washer on the end of the shaft, and see that the thrust ball is in the rear main bearing.

Take the front piston assembly with the cam in place in the right hand, and the hub of the flywheel in the left hand. Start the shaft through the front cam and then through the rear cam.

Enter the shaft in the rear main bearing and slide the cams to their place on the shaft so that they are morticed together with the cams on the opposite sides of the shaft.

Put the wood block in the crankcase against the rear cam so that the cams cannot turn, and turn the flywheel and shaft clockwise. The threads will engage on the rear cam and move up to their proper place.

After turning the shaft a few revolutions, start the seal nut on to the crankcase boss. The shaft should be turned, and the seal nut screwed to place at the same time. The seal nut must be screwed up tight. An 18-in. monkey wrench serves the purpose very well.

The seal spring holds the camshaft firmly against the thrust ball. There should be about 1/32-in. clearance between the thrust washer and the end of the front main bearing.

Before putting the cylinder block on the compressor, insert a screwdriver between the flywheel and the seal nut, forcing the two apart, and see that there is proper play between the thrust washer and the front main bearing. If the clearance is less than specified, there may be binding at this point when the compressor becomes hot.

After the piston assemblies are in place, the cylinder block, discharge

(Concluded on Page 17, Column 1)

QUIET AS A MOUSE



Sturdy and slipless, and built to fit, Gilmer refrigerator belts run quietly. No whistles. No groans. No squeaks.

Each belt sleeved and marked for easy identification. TODAY — write for folder, JS-94, that covers complete line of belts for all makes and models. L. H. GILMER COMPANY, Tacony, Phila., Pa.



Specialists in quality belts since 1903

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Makers of the World's Best-Known V-Belts

The RANCO THERMOSTAT for 1934 Has

1. One lever to start and stop the refrigeration system.
2. One lever used to start "defrost" and "fast freeze" cycles. (This lever returns automatically to its normal position at the proper temperature.)
3. A dial pointer for cold control.
4. An economy range at one pointer position.

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1300-10 Indianola Avenue, Columbus, Ohio

Operating & Service Data on Absopure Expansion Valves

(Concluded from Page 16, Column 5)
valve, and the cylinder head can be reassembled and the compressor put in operation.

Cleaning and Oiling the Compressor

Whenever the compressor is taken apart for any reason, the oil should be removed and discarded. Before the compressor is reassembled, the parts should all be thoroughly washed in carbon tetrachloride or gasoline. The former is preferable, as there is no fire hazard, and it is a better solvent of oil.

As soon as the parts are clean they should be oiled to prevent rusting. On a damp day, if all the oil is removed while cleaning, they may rust in a very few minutes.

Before reassembling the cylinders to the crankcase, fill the compressor to the level of the bottom of the oil gauge screw.

After a compressor is assembled and tested, the inlet and outlet connections must be capped to keep the air out of the compressor.

Other Compressor Parts

The seal on series "H," "I," and "J" Absopure compressors is practically the same as the seal on series "E" and "F" which were described on pages 16 and 17 of last week's (July 18) issue of *ELECTRIC REFRIGERATION NEWS*.

For service instructions on flywheels, end-thrust assemblies, and gaskets of the "H," "I," and "J" series, refer to last week's article, as these parts are very similar to the parts on the "E" and "F" series.

Condensers

Air-Cooled Condensers

Air-cooled condensers require almost no attention. If a condensing unit is installed in a very dirty or dusty place, see that the air passages do not become plugged or restricted, as a clean surface and good air circulation are very important.

Also, never allow an air-cooled condensing unit to operate at all without a fan. Excessive head pressures are bound to result.

Water-Cooled Condensers

The water-cooled condensers used on Absopure commercial condensing units are all of the double tube type. Condensers of this kind work as follows:

Methyl chloride vapor is compressed in a copper coil. Through this tube coil, a smaller copper tube is run, carrying water. The hot methyl chloride vapor enters at the top of the outside condenser tube. It is cooled and condensed as it flows to the bottom of the condenser by the cold water that enters the condenser at the bottom in the inside tube.

The inside tube that carries the water is continuous, with both ends outside of the condenser. This does away with any possible chance of a leak from the water system into the refrigerant-containing parts of the system.

The water enters the condenser through the inlet tube at the bottom of the condenser coil. The inlet tube connects directly to the water valve. The water leaves the condenser through the outlet tube at the top of the condenser. This outlet tube should be connected to a copper tube, lead tube, or pipe leading to the sewer or a drain pan.

Condensing units with water-cooled condensers must never be installed where they will be exposed to freezing temperatures. If a water-cooled condenser that contains water is to be exposed to freezing temperatures due to a store or other place of business being closed in the winter time, disconnect the water lines and blow the water out of the condenser from the top. The pressure in a service tank can be used for this purpose.

Due to the continuous tube carrying the water in a double-tube condenser, they never plug up with dirt or silt. The only service they ever require is a check for leaks at the end connections.

Receivers

A receiver is the tank that contains the liquid methyl chloride after it is condensed in the condenser. It is beneath the base, and below the condenser, so that the liquid flows to it from the condenser by gravity. The receiver is a steel tank made from steel tubing with steel ends welded in place.

There are both inlet and outlet connections on all receivers. The inlet connection simply enters the top of the receiver. On most receivers, this connection is a flare elbow. The outlet connection is fitted with a line valve with a flare connection to attach the liquid line.

This line valve, called the "bottom line valve" or "king valve," is

screwed and soldered into a boss on top of the receiver. On the bottom of the boss inside of the receiver, is a steel tube extending to the bottom of the receiver.

This arrangement makes it possible to take liquid methyl chloride out of the bottom of the receiver and still have the connections on the top of the receiver where they are accessible.

It is important that when a system is in operation, that liquid methyl chloride and not vapor be passing into the liquid line. For proper operation, the receiver should be about one-third full of methyl chloride liquid. This is sufficient to insure a liquid seal at all times, and still leave room in the receiver to pump over a freezing unit that may need repair.

Receivers on the larger Absopure commercial units are equipped with sight gauges. These gauges are of standard make, equipped with hand wheels, and are mounted on elbows that enter the receiver at the top and bottom.

By opening the two gauge valves, the liquid level will show in the gauge glass, giving you the exact liquid level in the receiver. The gauge valves should be opened for inspection, and then closed.

Never leave a unit with these gauge valves open. If there is any indication of leaks around the ends of the gauge glass, tighten the packing nuts at the top and bottom of the gauge glass very carefully.

Belts

All Absopure commercial condensing units are equipped with V-type rubber belts. The $\frac{3}{4}$ -hp. and larger units each have two belts, and the smaller ones one belt.

Belts of this type utilize only the sides as driving surfaces. They should not bottom in the flywheel or motor pulley groove.

The life of the belt depends largely on the alignment of the pulleys and the tension. Be sure that the pulleys are in line, and that the belts run straight and true. Motors are all on adjustable bases so that the belts can be tightened if necessary. A belt should be tight enough that it fits snugly on both pulleys, but must not be at all stretched.

Expansion Valve

The expansion valve is an automatic device that regulates the flow of methyl chloride from the liquid line to the freezing unit. It was seldom used on Absopure commercial installations, except on flat tank freezing units.

The expansion valve controls the flow of methyl chloride entirely according to the suction line pressure; in other words, the valve will pass little or much liquid, depending on the amount of vapor the compressor takes out of the freezing unit. Refer to the drawing of this valve in Fig. 4.

The liquid line connects to the fitting shown at the bottom of the cut. The methyl chloride in liquid form enters the valve at this point, passes through the strainer "C," and into the jet. The needle "B" is held against the valve seat by spring "A." The inside section of the valve—shown black on the drawing—is a part of the low pressure side of the system. An outlet from this chamber leads to the freezing unit.

"D" is a flexible metal bellows that allows a free movement of the plate that rests against the long arm of the lever. "E" is an adjusting screw which regulates the tension on spring "F."

When the suction or low side pressure is reduced, spring "F" overcomes the pressure against the bellows plate, and forces the end of the lever down, lifting the needle away from the valve seat and admitting liquid methyl chloride from the high pressure side of the system.

The added methyl chloride builds up the pressure in the low side, overcoming the pressure of spring "F"; the pressure is removed from the end of the lever, and spring "A" forces

Expansion Valve

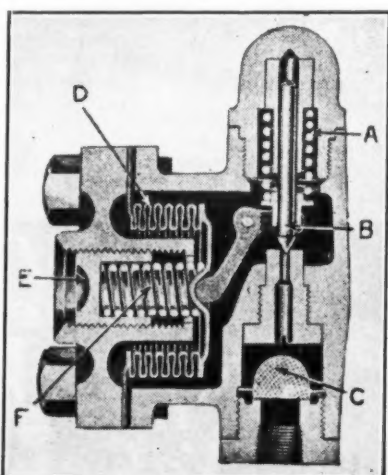


Fig. 4. Absopure automatic expansion valve, with parts lettered for description above.

the needle against the seat, stopping the flow.

A cap which is not shown on the drawing, seals the opening above the adjusting screw, excluding the air from the inside of the bellows. This cap must always be in place when the unit is in operation, as frost and ice will form in the convolutions of the bellows if this part is not sealed, and cause the valve to cease functioning.

To Raise the Suction Line Pressure, remove the cap from above the adjusting screw and turn the adjusting screw with a screw driver, clockwise, turning the screw in. Turn the screw slowly, watching the pressure gauge until the desired pressure is reached, then replace the cap.

To Lower the Suction Line Pressure, remove the cap from above the adjusting screw and turn the adjusting screw with a screw driver, counter-clockwise, turning the screw out. Turn the screw slowly, watching the pressure gauge until the desired pressure is reached, then replace the cap.

Repair of Expansion Valves

Occasionally, you may find a valve on which the end caps have to be tightened to stop leaks. This can be done easily with two wrenches, one on each cap.

The bellows assembly is soldered into the valve body; therefore, the gasket under the large plate is not required to hold pressure. If a leak is found around this gasket or the adjusting screw, the valve should be replaced as the leak is through the bellows.

There is a chance that foreign matter may plug up the strainer. The strainer can easily be removed and cleaned, or replaced. If the valve will not pass methyl chloride, causing a low suction line pressure, remove both the strainer and the valve seat and examine them.

The valve seat can be taken out easily with a screw driver after the cap is removed. See that the passage is clear and the valve clean.

If a valve appears dirty on the inside, it should be removed from the system, the two end plugs removed, and the whole mechanism thoroughly washed with carbon tetrachloride, gasoline, or alcohol.

Moisture in a refrigerating system will "freeze up" an expansion valve so that it will pass no refrigerant, or cause it to work erratically. This subject will be covered next week.

N.Y. Firm Services 3 Makes of Units

By Elston D. Herron

NEW YORK CITY—E. A. Wenk, head of the Automatic Refrigeration Service Co. here, believes the time is coming when independent service will be a much better business to be in than it is today.

He reasons thus: In many factory branches, distributorships, and dealerships, the service department does not pay its own way. And with refrigeration prices as they are, sales cannot forever continue to "carry" service. So when these outlets' service charges are boosted to the place where they will net the department enough to pay all its expenses, independents will be able to compete with them at a fair profit.

"Greatest weakness of the independent service business today is a lack of knowledge about the cost of operating. That becomes apparent when one sees the estimates made on a certain job by a number of companies—they vary ridiculously."

Mr. Wenk's company limits itself to service of Frigidaire, Kelvinator, and Welsbach refrigeration systems except in unusual instances. Frigidaire parts which it cannot buy from supply houses or make in its own shop it obtains from the factory branch—the purchases actually being made by apartment houses or buildings using Frigidaire machines on which Automatic does service work. Kelvinator parts are bought directly from the factory branch.

On charges made by the company for various service jobs, he says:

"We have a fixed charge of \$2 for the first 40 minutes' work on commercial machines, and \$1.60 an hour after the first 40 minutes. On household jobs, we charge \$2.50 for the first hour, and \$1.60 an hour for all time after the first hour. All of this is, of course, exclusive of materials. For any call outside of metropolitan New York City, we get 10 cents a mile and \$1.60 per hour per man."

"For a complete overhaul job on most household systems we charge \$35. Our charge is \$70 for overhauling commercial systems up to $\frac{1}{2}$ hp., where we replace the condensing unit and give a one-year guarantee on the one we install. Charges vary on systems of more than $\frac{1}{2}$ hp., and on systems of that size, we often can't give immediate replacement of the condensing unit, but usually can make arrangement whereby the owner receives refrigeration while we overhaul the unit."

Following is a schedule of Automatic's charges for motor replacement, exclusive of installation: $\frac{1}{2}$ hp., \$12.50; $\frac{3}{4}$ hp., \$15; 1 hp., \$16.50; $\frac{1}{2}$ hp., \$22; $\frac{3}{4}$ hp., \$31.50; 1 hp., \$36.

Melchior Enters a New Market



Melchior, Armstrong, Dessau Co. goes into the refrigerated truck business. The truck shown here was the first one sold, and was delivered to the Economy Grocery Stores Co. of Boston. It uses a Ford chassis, Robbins & Burke body, Kelvinator compressor, and Kold-Hold cooling units. Left to right: J. J. Marshall, general sales manager of Melchior, Armstrong, Dessau; John Burke of the truck body company; W. G. Farnsworth, Kold-Hold general manager; Henry A. Dolan, manager, Melchior's Boston branch; Ray Legg, Kelvinator eastern commercial manager.

Melchior's Supply & Export Business Shows Good Increase

By Elston D. Herron

NEW YORK CITY—During the first six months of this year, sales of refrigeration supplies in this country by Melchior, Armstrong, Dessau Co. were 65 per cent ahead of the same period in 1933, and export business was 130 per cent greater than for that period last year, according to Miss F. M. Dessau of the jobbing and exporting company.

Items for which domestic demand has been particularly strong this season are Fedders continuous tube Forcedraft unit coolers, Detroit and Fedders automatic and thermostatic expansion valves, Ranco controls, copper tubing, belts, and refrigerants.

A good percentage of the concern's sales increase has been due to purchases by independent service companies, says Miss Dessau. Their orders for tools, refrigerants, belts, and controls have come in heavily all season. Since Melchior Armstrong moved into its new quarters at 300 Fourth Ave. here, its over-the-counter business with independent servicemen has grown considerably.

The company's increase in business in this country has not been confined to small refrigeration supplies. Collis, Temprite beer coolers, and Forcedraft units have moved in substantially larger volume than last year.

As a means of promoting sales, especially in sections of the country not near its headquarters or branch offices, the company has begun issuance of a monthly bulletin which highlights various items in its line. Each mailing consists of 10,000 copies.

Total personnel of the firm has been upped 25 per cent since the first of the year. There are now 50 office employees and seven salesmen at headquarters here, nine in the office and five salesmen at the Philadelphia branch, and six in the office and five salesmen at the Boston branch.

George F. Sperber, formerly with Frigidaire and Kelvinator in their ice cream cabinet divisions, has joined the company as special salesman to contact ice cream companies. Melchior has just been appointed distributor for the circulating sweet-water milk coolers made by Fleetwood Corp. of Norristown, Pa.

The recent slide in the American dollar's exchange value has caused companies in many foreign countries to go back to the purchase of complete American-made refrigeration systems, where as for some time they had been buying only bare compressors, states J. J. Marshall, sales manager of the firm.

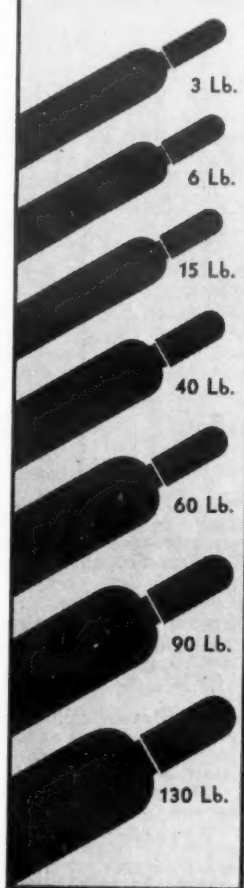
Pointing out some of the obstacles in the export business as it is today, he says: "It takes about nine months for us to get our money for goods sent to Argentina and Brazil. In Argentina, Czechoslovakia, and some other countries, there is a law prohibiting any importation unless the seller has a license from the government. And in Germany, which was our best market, there is now a law limiting an importer to a volume of purchases not greater than 10 per cent of his foreign exchange in 1931."

"Australia is making a strong comeback in volume of purchases of refrigeration equipment made in this country, despite the fact that it must pay an 85 per cent duty and stand a loss of 26½ per cent in exchange. South Africa is also making more purchases because the price of gold has gone up, making it a prosperous country. It is not an industrial country, so American manufacturers have a good market there."

On cultivation of foreign markets, Mr. Marshall commented, "We have endeavored to increase sales of our goods in other countries by having our salesmen teach people there new applications for the products we sell. We issue sales bulletins in English, French, Spanish, and German, describing the construction and purpose of each item, but emphasizing the varied ways in which it may be used."

The company maintains 12 salesmen in Europe, South America, South Africa, and Australia.

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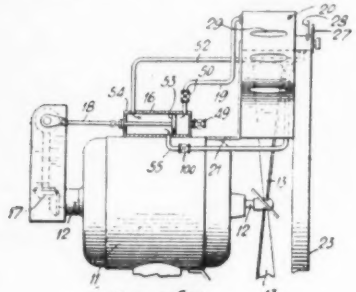


PATENTS

Issued July 10, 1934

1,965,562. AIR CONDITIONING AND REFRESHING SYSTEM. Sverre C. Ask-haven, Brooklyn, N. Y. Application March 7, 1933. Serial No. 559,915. 3 Claims. (Cl. 62-136.)

3. In an air conditioning and refreshing system, a fan, a prime mover therefor, a fluid compressor supported by said prime



1,965,562

mover, driving means for the compressor connecting the same with said prime mover, an arcuate compression chamber supported by said prime mover in the plane of said fan and in circumferential relation thereto, an expansion chamber communicating with said compression chamber, and means to circulate an expanded cooling medium from said expansion chamber into the path of the air currents from said fan.

1,965,616. AUTOMATIC CONTROL OF THE PROCESSING OF MATERIALS. Clarence W. Vogt, Louisville, Ky., assignor, by mesne assignments, to Vogt Processes, Inc., Louisville, Ky., a corporation of Delaware. Application Oct. 15, 1930. Serial No. 488,809. 19 Claims. (Cl. 62-4.)

10. An apparatus for processing material including means for subjecting said material to the action of a refrigerating medium to change the plasticity thereof, a photoelectric cell, means for varying the activation of said cell in accordance with variations in the pressure of the material under process, and means for varying the effective action of the refrigerating medium in accordance with variations in the activation of said cell.

1,965,617. METHOD AND APPARATUS FOR PROCESSING MATERIALS. Clarence W. Vogt, Louisville, Ky., assignor, by mesne assignments, to Vogt Processes, Inc., Louisville, Ky., a corporation of Delaware. Application Nov. 1, 1930. Serial No. 492,727. 24 Claims. (Cl. 62-174.)

1. The method of refrigerating a material to effect crystallization of at least a portion thereof, which includes causing the material to flow in a comparatively thin confined layer, subjecting it to the action of a temperature changing medium while in said layer, mechanically agitating the material in said layer, and advancing the material through a second comparatively thin confined layer but in a substantially quiescent state.

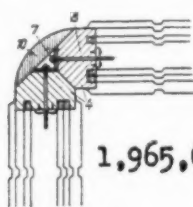
1,965,619. APPARATUS FOR FORMING SHAPED BODIES OF ICE CREAM. Clarence W. Vogt, Louisville, Ky., assignor, by mesne assignments, to Vogt Processes, Inc., Louisville, Ky., a corporation of Delaware. Application Sept. 26, 1931. Serial No. 565,257. 17 Claims. (Cl. 257-96.)

1. An apparatus for forming shaped bodies of hardened ice cream, which includes an endwise movable, refrigerated open channel, means for delivering partly frozen aerated ice cream under pressure to said channel, whereby upon release of pressure, the ice cream tends to expand out of the channel, and a member extending across the open side of said channel adjacent to the delivery means, for returning to said channel the ice cream expanding therefrom.

1,965,624. METHOD OF FREEZING FOOD PRODUCTS. John M. Young, Brooklyn, N. Y., assignor to American Can Co., New York, N. Y., a corporation of New Jersey. Application Oct. 16, 1929. Serial No. 400,110. 2 Claims. (Cl. 62-170.)

2. The method of freezing food products, which consists in packing a food product within a container which is a poor conductor of heat, enclosing and sealing said container and product within an outer vessel which is a good conductor of heat, and then subjecting said outer vessel and sealed contents to a freezing temperature by immersing the same in a liquid refrigerant and thereby rapidly extracting the heat of said product outward into said container and thence into said outer vessel and thence into said liquid refrigerant, until said product is frozen, after which treatment said container will retard the reabsorption of heat into said product.

1,965,636. HEAT-INSULATING WALL. Friedrich Forster and Robert Kraft, Finow/Mark, Germany. Application Sept.



1,965,636

8, 1930. Serial No. 480,289. 5 Claims. (Cl. 189-34.)

1. A heat-insulating unit comprising a

PATENTS
Searches, Reports, Opinions by a
Specialist in REFRIGERATION
H. R. VAN DEVENTER
Solicitor of Patents Refrigeration Engineer
343 MADISON AVE. NEW YORK

frame having poor heat-conducting properties, bendable metal plates on opposite sides of said frame, said plates and the frame enclosing a dead air space, at least one metal partition secured to the frame between the metal side plates and dividing the dead air space enclosed by the side plates and frame into a plurality of dead air spaces, said frame insulating the metal side plates from one another and from the metal partition, the interior of at least one of the metal walls defining each dead air space being covered with a heat-insulating material, whereby if any of said metal walls are deformed so as to contact with another metal wall, said heat-insulating material will retard the free conduction of heat between the walls, said heat-insulating material having a rough surface which will retard the flow of air therealong.

1,965,682. COATING ALUMINUM. Harold K. Work, Oakmont, Pa., assignor, by mesne assignments, to Aluminum Colors, Inc., Indianapolis, Ind., a corporation of Delaware. No Drawing. Application Jan. 26, 1932. Serial No. 589,056. 8 Claims. (Cl. 204-1.)

1. The process of producing oxide-coated aluminum which comprises making the article to be coated an anode in an electrolytic cell, the electrolyte of which contains in solution 0.5 to 70 per cent sulfuric acid and a dibasic organic acid of the group consisting of oxalic, malic, malonic, maleic and succinic acids in the range of 0.5 per cent to the saturation limit.

1,965,683. COATING ALUMINUM. Harold K. Work, Oakmont, Pa., assignor, by mesne assignments, to Aluminum Colors, Inc., Indianapolis, Ind., a corporation of Delaware. No Drawing. Application Jan. 26, 1932. Serial No. 589,057. 3 Claims. (Cl. 204-1.)

1. A method of providing aluminum with a multiple-layered integrally-united oxide coating comprising forming on the aluminum surface a previous oxide coating by making the aluminum anode in an electrolyte of a 2 to 70 per cent solution of sulfuric acid, thereafter making the aluminum anode in an electrolyte of a dibasic organic acid of the group consisting of oxalic acid and malonic acid, and forming through the initially applied oxide layer and upon the underlying aluminum surface a second oxide layer of different properties integrally united with said aluminum surface and with the initially applied oxide layer.

1,965,733. METHOD AND APPARATUS FOR HEATING, COOLING AND VENTILATING. Clark W. Chamberlain, East Lansing, Mich. Application Jan. 2, 1931. Serial No. 506,175. 6 Claims. (Cl. 257-9.)

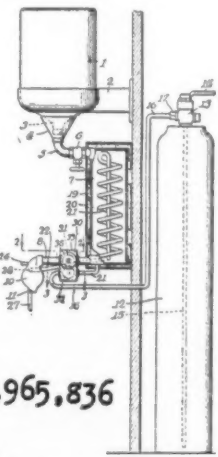
1. The method of tempering the air of an enclosed space, which comprises the steps of drawing separate apportioned amounts of air from such space and from the space surrounding the same, compressing one of said amounts of air, cooling said compressed air, adiabatically expanding said compressed air and discharging the same to one of said spaces, and simultaneously discharging the other of said amounts of air to the other of said spaces, the cooling of said compressed air being accomplished solely by the last named amount of air.

1,965,802. APPARATUS FOR PRE-COOLING CARS. Walter C. Phillips, San Francisco, Calif. Application Feb. 19, 1932. Serial No. 594,043. 2 Claims. (Cl. 62-24.)

1. Apparatus for precooling a car having a refrigerant bunker and a load compartment partially separated by a bunker wall providing openings adjacent the top and bottom of said car, said apparatus comprising a removable partition for closing said top opening, said partition having an aperture therein, a fan mounted in said aperture exteriorly of said bunker compartment for forcing cooled air from the top of said bunker compartment toward the center of said load compartment and a second fan spaced from said first mentioned fan and positioned adjacent the top of said car between said first mentioned fan and the center of said load compartment for forcing a portion of said cooled air to the center of said load compartment.

1,965,836. APPARATUS FOR COOLING AND AERATING LIQUIDS. Wilfrid Paul Heath, Seattle, Wash. Application Feb. 1, 1929. Serial No. 336,690. 10 Claims. (Cl. 62-92.)

1. In apparatus of the character described, the combination, with a liquid cooling chamber and a refrigerating ele-



1,965,836

ment therein, of means acting upon operation to release liquid from said chamber and simultaneously introduce and permit the expansion of a liquefied gas in said element.

1,965,901. DEVICE FOR THE MAKING OF EDIBLE ICES. Ernest E. Lindsey, San Francisco, Calif. Application Aug. 19, 1932. Serial No. 629,532. 12 Claims. (Cl. 62-174.)

1. Means for making frozen confections comprising a cylinder having an inner surface adapted to be cooled, means for cooling said surface, a motor having a hollow shaft, a container for unfrozen confection at one end of said shaft, a centrifugal spray nozzle at the other end of said shaft, means for inserting said nozzle in said cylinder, means for traversing said inner surface with said nozzle

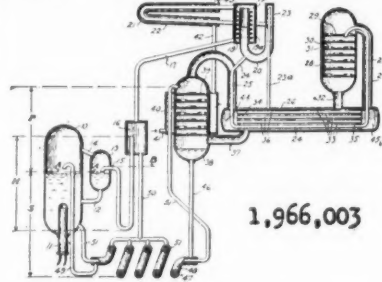
so that a fine spray of unfrozen confection may be deposited on the entire area of said inner surface, and means attached to said nozzle to scrape said deposit from said surface when frozen.

1,965,922. APPARATUS FOR THE MANUFACTURE OF CAKES OF CARBONIC SNOW. Henri Fievet La Madeleine Les Lille, France. Application June 24, 1930. Serial No. 463,528. In France June 26, 1929. 7 Claims. (Cl. 62-121.)

1. In an apparatus for the manufacture of cakes of carbonic dioxide snow by expansion of liquid carbon dioxide, the combination of a vessel in which is provided an expansion chamber having one of its sides open, a cover on this open side of the said expansion chamber, a pivot on one side of the said vessel, a hook resiliently connected to the cover and engaging with the said pivot, and connecting means on the side of the cover opposed to that carrying the said hook, adapted to resiliently press the said cover on the vessel.

1,966,003. REFRIGERATION. Thore M. Elfving, Stockholm, Sweden, assignor to Electrolux Servel Corp., New York, N. Y., a corporation of Delaware. Application Nov. 25, 1927. Serial No. 235,487. Renewed Nov. 22, 1928. In Germany Dec. 31, 1926. 11 Claims. (Cl. 62-119.5.)

7. Refrigerating apparatus comprising a generator, a condenser, an evaporator, an absorber, a conduit for conveying liquid



1,966,003

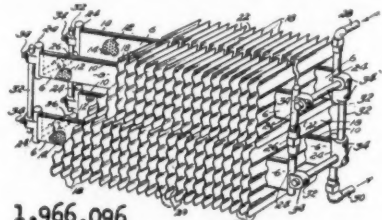
from said absorber to said generator, means for heating said conduit to evolve vapor from the liquid therein, means for conveying said vapor from said conduit to said condenser without passing through said generator, and means for conducting vapor from the generator to said condenser without affecting flow of liquid from the absorber to the generator.

1,966,034. AIR CONDITIONING APPARATUS. Frederick W. Hensler, Indianapolis, Ind. Application Feb. 3, 1932. Serial No. 590,738. 3 Claims. (Cl. 257-245.)

1. The combination with adjacent air conduits having a partition therebetween, of means for transferring moisture from one conduit to the other comprising a plurality of transverse wicks threaded through openings in said partition to expose alternate portions of each wick to the air current in said conduits, and a longitudinal wick in one of said conduits connecting said transverse wicks.

1,966,096. REFRIGERATING COIL. Ernest R. Hopkins, Kansas City, Mo., assignor of one-half to James P. Curry, Kansas City, Mo. Application June 13, 1932. Serial No. 616,533. 8 Claims. (Cl. 257-255.)

1. A refrigerating coil comprising a plurality of juxtaposed units each having a refrigerant conduit and a plurality of



1,966,096

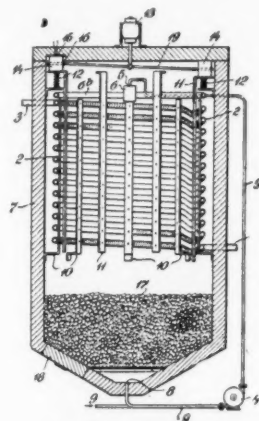
fins in heat exchanging relation with a predetermined length of said conduit, said predetermined length of conduit being flattened-tubular in cross-section to form an attenuated refrigerant passage; and a perforated heat-conducting baffle member within said length of conduit in contact with the inner face of said conduit, said baffle member being of the same general flattened cross section as the said flattened conduit.

1,966,099. DEFROSTER FOR REFRIGERATING DEVICES. W. Kent Lewis, Selma, Calif. Application Jan. 16, 1933. Serial No. 651,880. 4 Claims. (Cl. 62-4.)

1. In a refrigerating device having pipes through which a freezing medium is circulated and having means for impelling said circulation, said impelling means being controlled in whole or in part by an electrical current, a source of electrical energy and leads from said source of electrical energy to said impelling means, a switch positioned on said line adapted to make and to break said electrical current, timed means for moving said switch toward, across and away from said pipe over the accumulations of frost or ice on said pipes being adapted to open said switch by means of an arm forming a part of said switch, said arm being adapted to open said switch, said arm being positioned so that one end thereof is a spaced distance from the pipe during the period when said arm is passing over the pipe, said frost and ice being adapted to move said arm and to open said switch, and said clock means being adapted to carry said switch beyond the point where the arm comes in contact with said frost and ice.

1,966,150. DEVICE FOR PRODUCING ARTIFICIAL ICE. Walther Tamm, Munich, Germany, assignor of one-half to Emil Witzemann, Pforzheim, Germany. Application Jan. 13, 1933. Serial No. 651,604. In Germany Jan. 22, 1932. 6 Claims. (Cl. 62-105.)

1. A device for producing artificial ice in the form of pieces resembling broken glass, comprising, in combination, a helically wound flexible pipe, stationary bars located parallel to the axis of the helical pipe and being connected with alternate windings of the same, movable bars also arranged parallel to said axis and being connected with the other windings of the helical pipe, means for reciprocating said movable bars, means for conducting a



1,966,150

refrigerating agent through the said pipe, and means for conducting water over it.

1,966,164. TRAVELING REFRIGERATOR. Isaac J. Clark, Denver, Colo. Application Jan. 8, 1934. Serial No. 705,723. 2 Claims. (Cl. 62-117.)

1. In a traveling refrigerator, the combination with a truck having an engine, a generator, an electrical storage battery in electrical communication with the generator and a towing platform provided with a pivot, of a trailer refrigerator having a socket adapted to member with the pivot for towing the trailer and permitting turning movements of the traveling refrigerator, said trailer provided with insulated compartments for the storage of perishable merchandise during transit, refrigerating means carried by the trailer including a direct current motor, and an electrical conduit for the motor adapted to be placed in electrical communication with the battery of the truck for driving the motor and refrigerating said compartments, said conduit being of flexible construction to permit pivotal swinging movements of the truck with respect to the trailer, an adaptor on said trailer for changing alternating current into direct current, an electrical socket on the exterior of said trailer, said adaptor being so connected to said motor and electrical socket that when alternating current is

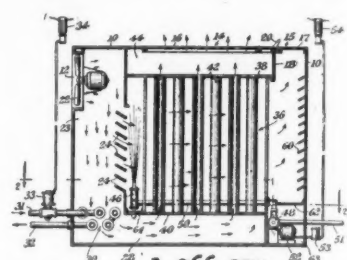
applied to said electrical socket, when said trailer is disconnected from said truck, the direct current motor will be actuated and the insulated compartments in said trailer will be refrigerated.

1,966,173. TREATMENT OF GAS AND APPARATUS THEREFOR. James M. Jenkins, Philadelphia, Pa., Richard C. Thompson, Woodmont, Conn., and Daniel Raymond McNeal, Abington, Pa., assignors to Andale Co., Philadelphia, Pa., a corporation of Pennsylvania. Application May 8, 1931. Serial No. 536,000. 11 Claims. (Cl. 62-179.)

4. In the manufacture and distribution of artificial gas, that method of dehydrating the gas before distribution which comprises cooling the gas by the absorption refrigeration process and separating the refrigerant from the solvent by utilizing heat from the gas as it leaves the plant.

1,966,275. METHOD OF AND APPARATUS FOR CONDITIONING AIR. Archibald F. Wright, South Orange, N. J. Application July 12, 1933. Serial No. 679,996. 6 Claims. (Cl. 261-13.)

1. A method of conditioning air, which comprises, spraying water into air to allow partial evaporation of the water



1,966,275

and cooling of the air, conducting the cooled air into contact with relatively thin tubes containing air to be cooled so that the heat in the air in the tubes will be transferred to the air on the outside of the tubes, then causing further evaporation of water to cool the outside air, and then contacting the relatively thin tubes with the cooled air to extract heat from the warmer air inside the tubes and cool the air inside the tubes.

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WIDE TEMPERATURE RANGE

Instantaneous Indirect Cooling • Wide Capacity Range • Compact

Commercial Coil & Refrigeration Co. 455 N. Artesian Ave., CHICAGO

Sturdy Condensing Units from 80 to 2868 Lbs. I.M.E., and all other commercial refrigeration equipment—Wall type cases with machinery—A beautiful household line of modern, conservative styles—Write for full data.

THE STARR COMPANY

Richmond, Indiana (factory) Since 1907

U. S. A. 1344 S. Flower St., Los Angeles, Calif.

Style EW—Water Cooled With Water Cooled Head

Cable "Starr"

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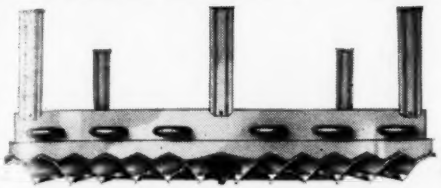
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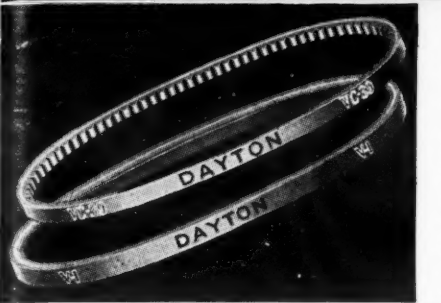
PEERLESS FLASH COOLER

The NEW Eye Appealing
Method of Cooling Walk-
In Refrigerators

STYLE & RESULTS

Fin Coils and Drip Pans Engineered in an Integral
Unit—Saves Installation Cost and Operating Cost

PEERLESS ICE MACHINE CO. 515 W. 35th St. Chicago

DAYTON V-BELTS

● There is a Dayton V-Belt for all
makes and types of refrigerators.
A stock is available near you.
Send for price list and name of
your nearest distributor.

THE DAYTON RUBBER MFG. CO.
DAYTON, OHIO

The world's largest manufacturer of V-Belts

COPELAND REPAIRS — REPLACEMENTS

REPAIRS	REPLACEMENT PARTS
B & B Household Controls.....\$2.50	Howell Special Capacitor Type
Penn Household Controls.....2.50	1/2 HP Refrigerator Motor.....\$11.00
Penn Commercial Controls.....4.50	Amer. Rad. Household Exp. Valve 4.50
Amer. Rad. Household Exp. Valve 2.50	Amer. Rad. Multiple Exp. Valve 7.50
Amer. Rad. Multiple Exp. Valve 3.50	Penn Commercial Controls \$8 & \$12.00
Apex Water Regulating Valve.....3.50	Iso Butane (Freezel) Per lb.....1.25
Penn Water Regulating Valve.....3.50	Methyl Chloride, Per lb......70

We also carry a complete stock of Gilmer Belts, Penn Water Regulating Valves, Glass Defrosting Trays, Lead and Fibre Gaskets, Etc. WRITE FOR PRICES.
Forty Eight Hour service on repairs, immediate shipment on replacements. All Repairs and Parts guaranteed to be free from defects in Workmanship, and Material for ONE YEAR.

REFRIGERATION SERVICE LABORATORIES, INC.

418-20 Rush Street

Chicago, Illinois.

THE TRADEMARK OF FOUR PACE SETTERS IN COIL EFFICIENCY

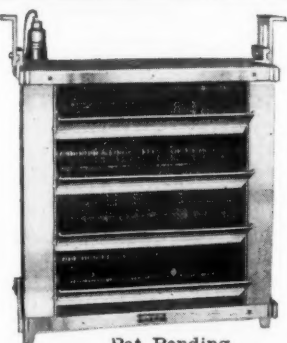
SUR-E-FEX Fin Coils
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SEND FOR NEW CATALOG DESCRIBING
THESE SENSATIONAL DEVELOPMENTS

REFRIGERATION APPLIANCES, INC.

H. J. KRACKOWIZER, Pres.

1342 WEST LAKE ST., CHICAGO

**COOL-RITE**

Unit Cooler with exclusive
HUMIDITY RESERVOIRS

The definite scientific contribution to the industry—tens of thousands of humidifier cups in each unit—actually produce high constant relative humidity. Third year of proven success, due to correct capacities, quality and results.
For Walk-ins & Display Cases—9 models & sizes.

COOL-RITE PRODUCTS CORP.

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79-85 Willow St.

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REFRIGERATOR PARTS

For ALL MAKES in Stock

Send For Our Catalog

Dehydrated Tubing
Brass Fittings, Pins
Flots, Seals, Gaskets

Temperature Controls
Expansion Valves
Condensing Units

THE HARRY ALTER CO.
1728 S. Michigan Ave. CHICAGO

Listing Over
2,000
Items

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for Electric Refrigeration News and
1934 Refrigeration Directory and Market Data Book

Business News Publishing Co.
5229 Cass Ave., Detroit, Mich.

Date.....

☐ Send me the 1934 Refrigeration Directory and Market Data Book.

☐ Enclosed find \$3.00.

☐ Enter my subscription to Electric Refrigeration News for one year.

☐ Enclosed find \$3.00.

☐ Enclosed find \$5.00, combination rate for both the News and the Directory.

☐ I am already a subscriber, extend my present subscription.

Name

Attention of In Care of

Street Address

City and State

We sell the refrigerator.

The above rates apply only to United States and Possessions and Pan-American Postal Union Countries. Rate for Canada—Directory, \$4.00; News, \$3.00; Combination, \$11.00. Rate for all other foreign countries—Directory, \$5.00; News, \$5.00; Combination, \$9.00.

7-25-34

QUESTIONS**Display Case Makers**

No. 1754. (Manufacturer, Michigan)
—“We are desirous of securing an up-to-date list of all the refrigerator display case manufacturers as we have considerable surplus material suitable for that type of work which we are desirous of selling.”

“Have you such a list available? If so, we would appreciate a copy.”

Answer: See page 281 of the 1934 REFRIGERATION DIRECTORY for manufacturers of commercial refrigerator display cases.

Mayson Expansion Valves

No. 1755. (Distributor, California)—“Please furnish me with the name and address of the manufacturer of the Mayson expansion valves. We believe these expansion valves are sold in the vicinity of Chicago.”

Answer: (See below).

No. 1756. —“Would you be kind enough to give us the name and address of the firm manufacturing Mason expansion valves and oblige.”

Answer: We believe that you must have reference to the Mayson expansion valve manufactured by Mayson Mfg. Co., 4332 Horatio St., Detroit, Mich.

Kerosene Refrigerators

No. 1757. (Distributor, Georgia)—“We are feeling the necessity of investigating the possibilities of securing a good refrigerator operated with kerosene or gasoline.”

“We are of the opinion that there will be a very good market in our rural districts this early fall, and would appreciate very much your giving us the names of all manufacturers who, to your knowledge, are making kerosene refrigerators and gasoline refrigerators.”

“We would appreciate your telling us which would make the best proposition from the profit standpoint, both for ourselves and for our dealers, as well as having a unit which has been more or less mechanically perfected.”

“We have already received information from Waukesha Motor Co. relative to their gasoline-operated job.”

Answer: See page 274 of the 1934 REFRIGERATION DIRECTORY for manufacturers of kerosene-operated refrigerators.

Household Compressors

No. 1758. (Manufacturer, Ohio)—“We are very much interested in having the names of important manufacturers of refrigeration compressors. We have reference to the small compressors for household refrigerators. Any information that you could give us on such manufacturers, and the total number of units manufactured by them annually, would be much appreciated.”

Answer: See page 178 of the 1934 REFRIGERATION DIRECTORY for manufacturers of household size compressors.

According to the 1933 report of the Refrigeration Division of the National Electrical Manufacturers Association, member companies sold 913,299 household compressors divided as follows:

In complete self-contained systems	880,860
In separate systems	19,179
In separate high sides under 1/2 hp.	13,260
.....	913,299

TVA Models

No. 1759. (Distributor, New York)—“We understand that several of the important manufacturers of compressors and other parts of household refrigerator units are working on bringing out a lower-priced model for refrigerator assemblers comparable with the ‘T.V.A.’ models which G.E., Kelvinator, and Frigidaire have placed on sale.”

“If you can give us any information on the progress which these manufacturers of parts are making towards bringing out this lower priced unit, we will greatly appreciate it.”

Answer: See announcement in this issue of the new ‘T.V.A.’ model introduced by Crosley Radio Corp., Cincinnati, Ohio. Other developments in the field of low-priced models will be announced in the editorial columns of ELECTRIC REFRIGERATION NEWS as soon as information is made available by the manufacturers.

Recipe Books

No. 1760. (Manufacturer, California)—“We would appreciate it very much if you could let us have information as to where we might obtain a standard form recipe book suitable to adopt for the merchandising of our units.”

Answer: Borden Kitchen Institute, 350 W. Madison Ave., New York City, has issued several recipe books for use in connection with household electric refrigerators.

Several manufacturers of household electric refrigerators have put out

recipe books for use by their distributors and dealers, which might be used as models.

Paper on Steam Jet Cycle

No. 1761. (Utah)—“In the ELECTRIC REFRIGERATION NEWS of June 27 there was an article describing a paper given at a recent convention of one of the organizations of refrigerating engineers by Peter Kalutian on the steam jet cycle of refrigeration.”

“Will it be possible for you to send me a copy of his paper? If not, will it be asking too much to tell me where I may send for it?”

Answer: The paper by Mr. Kalutian on the steam jet cycle of refrigeration was presented at the annual spring meeting of the American Society of Refrigerating Engineers on June 22. The paper was reprinted for this meeting, and it may be that extra copies are available. Address David L. Fiske, Secretary, American Society of Refrigerating Engineers, 37 W. 39th St., New York City.

Bryant Compressor Seal

No. 1762. (Service Company, Ohio)—“Can you inform me as to where I might purchase replacement parts for a domestic refrigerator manufactured by the Bryant Electric Corp. of New Bedford, Pa. This is a Model A, Serial No. 063, and needs a compressor seal assembly.”

Beer Pressure Control

No. 1763. (Manufacturer, Canada)—“We would like to know if there is anything to substitute for the Liquid-Zahm System made by the Liquid Carbonic Corp.”

“This is a silver tank which takes the place of the block tin coil in a small beer dispenser. The beer enters the tank near the top of the tank and is drawn off the bottom and is so designed as to prevent free gas from coming through with the beer and causing excessive foaming.”

Answer: In an article which appeared in the July 11 issue of ELECTRIC REFRIGERATION NEWS, S. V. Allmont, manager Liquid Cooling Division, Kelvinator Corp., discussed the methods of pressure control employed in beer coolers and dispensers made by Russ Soda Fountain Co., Cleveland, and Temprite Products Co., Detroit.

Also see the article dealing with the BeeReol beer cooler which appears on page 4 of this issue.

National Refrigeration Units

No. 1764. (Store Outfitters, Missouri)—“Could you tell us who manufactures the National refrigeration unit? We have come across certain literature that recommends this unit and we would appreciate this information.”

Answer: Several refrigeration units have borne the trade name ‘National.’ One unit, manufactured by Universal Cooler Corp., was sold for a time by H. M. Robins Co., Detroit, under the name National Electric. These models have been discontinued.

The National Electric Equipment Corp. of Los Angeles, Calif., manufactured a unit with this trade name several years ago, but they are no longer in production. Another unit bearing the name National was made by National Electric Refrigeration Corp., Scranton, Pa. This company has gone out of business and the unit is no longer being made.

A forerunner of the Faraday absorption refrigeration unit was also a ‘National,’ having been developed by the National Refrigerating Co. of New Haven, Conn. It bore the trade name ‘Ice-O-Lator.’ Several years ago it was purchased by General Motors, and is now dormant.

Sales by States

No. 1765. (Distributor, New York)—“Have you any figures which would show the total number of household refrigerators, all makes, which have been sold or delivered into the following states by year for the last three years: South Carolina, North Carolina, Georgia.”

Answer: Estimates by the Electric Refrigeration Bureau show unit sales for the above-mentioned states as follows:

	South Carolina	North Carolina	Georgia
1931	4,905	11,391	10,220
1932	3,124	6,352	6,538
1933	5,589	14,103	11,823
1934			
(five mo.) ..	6,209	14,815	12,460

Majestic Service Data

No. 1766. (Service Engineer, Massachusetts)—“I would like to get the copy of ELECTRIC REFRIGERATION NEWS that carried service information on the Majestic hermetic unit.”

“If you have any other data or information regarding this unit, I would be pleased to receive it. And would also like to know if replacement parts are available and where they might be obtained.”

Answer: Aug. 16, 1933 issue of ELECTRIC REFRIGERATION NEWS carried information on servicing the Majestic hermetically sealed unit. For information regarding replacement parts write to LeRo Williams or Thomas

CLASSIFIED

PAYMENT in advance is required for advertising in this column.
each. Three insertions \$5.00, additional words ten cents each.

RATES: Fifty words or less, one insertion \$3.00, additional words four cents

POSITIONS AVAILABLE

QUALIFIED Salesmen wanted who understand Refrigeration Beer Cooling Equipment to call on dealers and jobbers throughout the United States for one of the largest manufacturers of Portable Electric Steam Sterilizing Units. Trade name ‘Steamsterile’. Territories, drawings, and repeat commissions. Product absolutely new, mechanically perfect. Most attractive, and priced to sell. Box 634.

INSTRUCTORS wanted who can teach practical service on household and commercial plants up to 2 h.p., sulphur and methyl, expansion and float systems. State age, salary, experience, references. School to be located in Washington, D. C., opening about October 1. B. L. Williams, 240 1st St., N. W., Washington, D. C.

POSITIONS WANTED

MAN with good commercial-technical background, some experience in refrigeration, and good knowledge of foreign markets and languages, German, French, and Spanish, seeks position as export manager, correspondent, or foreign representative. Box 632.

SALES engineer available: Fifteen years' experience in every branch of air conditioning and refrigeration. Can lay out, design, build, and sell systems. Save old 324 tons of Freon and Methyl Chloride Air Conditioning plants in the past 90 days. Am now employed but am going to make a change. Box 635.

FRANCHISE OPEN

DISTRIBUTORS WANTED for improved type automatic coal stoker for residential use. Two years successful operation. Simplest design on market; therefore priced considerably under present price level, including a liberal profit margin for both distributor and dealer. Manufactured by old, well-established concern. Exclusive territories still open. Write for full particulars. Leach Company, Oskosh, Wis.

FOR SALE, the leading refrigerator dealership in a famous Florida resort center. This dealership has shown a profit every year during the depression. Twelve to fifteen thousand required to handle. Box 633.

DOMESTIC REFRIGERATION REPLACEMENT JOBBERS: Attractive Replacement Unit. Big demand. Large profits. Write Chas. Muller, Sales Mgr., Mid City National Bank Building, Chicago, Ill.

INDEPENDENT SERVICE COMPANIES

GUARANTEED thermostat repair service, B. and B. G. E., Cutler-Hammer, Penn. Ranco, Tag, etc. Regrid and polish float valve needles ten cents per needle, \$1.00 minimum charge. Expansion valves repaired. Gas service, Methyl, Ethyl, Sulphur, Iso-butane and others. Any amount, your cylinder or ours. Competitive prices. Haelectric Laboratory, 1793 Lakeview Road, Cleveland, Ohio.

Personal Guidance

EACH man trained by the U.E.I. method is judged as an individual. He is personally and individually guided through the training by a member of our Engineering Staff... No books... No classes... No mob psychology is employed.

UTILITIES ENGINEERING INSTITUTE
Wells at Kinzie Street, Chicago, Illinois
Complete and practical Refrigeration Training by extension methods.

Marshall receivers for Grigsby-Grunow Co., care of Edmund D. Adcock, referee in bankruptcy, 100 W. Monroe St., Chicago, Ill.

Ice Cream Cabinets

No. 1767. (Dealer, Pennsylvania)—“Are you able to advise whether or not there is an ice cream refrigerated cabinet of any make on the market at this time, constructed to hold twelve 2½-gallon cans in which the cans can be rotated in order to dip different flavors of ice cream from the same opening.”

“We would like to get some information as to price and dimensions of one this size with six openings.”

Schools

No. 1768. (West Virginia)—“Do you have a list of schools offering courses in electric refrigeration and air conditioning? If so, please send me one.”

Answer: The following institutions offer courses in electric refrigeration or air conditioning as indicated:

International Correspondence Schools
Scranton, Pa. (Air conditioning).
Rutgers University
New Brunswick, N. J. (Air conditioning).
Utilities Engineering Institute
404 N. Wells St., Chicago, Ill. (Refrigeration and air conditioning).
The Air-Conditioning Engineers Society
121 N. Clark St., Chicago, Ill. (Air conditioning).

For other institutions giving refrigeration courses see page 302 of the 1934 REFRIGERATION DIRECTORY.